

**SECTION 01 10 00.[Not Supplied - ProjectInfo : TONUM]
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1.0 PROJECT OBJECTIVES

1.0.1 The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for civilian sector projects that perform similar functions to the military projects. For example, a Company Operations Facility has the similar function as an office/warehouse in the civilian sector; therefore the design and construction practices for a company operations facility should be consistent with the design and construction of an office/warehouse building.

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
Aircraft Maintenance Shop	Aircraft Maintenance Shop

1.0.3 1.0.2 It is the Army's objective that these buildings will have a 25-year useful design life before a possible re-use/re-purpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. Therefore, the design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that time period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project OWNER. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles. The project site should be developed for efficiency and to convey a sense of unity or connectivity with the adjacent buildings and with the Installation as a whole.

1.0.4 Requirements stated in this contract are minimums. Innovative, creative, and life cycle cost effective solutions, which meet or exceed these requirements are encouraged. Further, the OFFEROR is encouraged to seek solutions that will expedite construction (panelization, pre-engineered, etc.) and shorten the schedule. **The intent of the Government is to emphasize the placement of funds into functional/operational requirements. Materials and methods should reflect this by choosing the most economical Type of Construction allowed by code for this occupancy/project allowing the funding to be reflected in the quality of interior/exterior finishes and systems selected.**

1.1. SECTION ORGANIZATION

This Section is organized under 6 major "paragraphs".

- (1) Paragraph 1 is intended to define the project objectives and to provide a comparison between the military facility(ies) and comparable "civilian" type buildings.
- (2) Paragraph 2 describes the scope of the project.
- (3) Paragraph 3 provides the functional, operational and facility specific design criteria for the specific facility type(s) included in this contract or task order.
- (4) Paragraph 4 lists applicable industry and government design criteria, generally applicable to all facility types, unless otherwise indicated in the Section. It is not intended to be all-inclusive. Other industry and government standards may also be used, where necessary to produce professional designs, unless they conflict with those listed.
- (5) Paragraph 5 contains Army Standard Design Criteria, generally applicable to all facility types, unless otherwise indicated in the Section.
- (6) Paragraph 6 contains installation and project specific criteria supplementing the other 5 paragraphs.

2.2. SITE:

Provide all site improvements necessary to support the new building facilities. Refer to Paragraph 6.

Approximate area available 0.00 acres

2.3. GOVERNMENT-FURNISHED GOVERNMENT-INSTALLED EQUIPMENT (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCRs/TVs, all utility connections and space with required clearances for all GFGI items. Fire extinguishers are GF/GI personal property, while fire extinguisher brackets and cabinets are Contractor furnished and installed CF/CI. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: [Not Supplied - FacilityAddREq : GFGI_ITEMS]

2.4. FURNITURE REQUIREMENTS

Provide furniture design for all spaces listed in Chapter 3 and including any existing furniture and equipment to be re-used. Coordinate with the user to define requirements for furniture systems, movable furniture, storage systems, equipment, any existing items to be reused, etc. Early coordination of furniture design is required for a complete and usable facility.

The procurement and installation of furniture is NOT included in this contract. Furniture will be provided and installed under a separate furniture vendor/installer contract. The general contractor shall accommodate that effort with allowance for entry of the furniture vendor/installer onto this project site at the appropriate time to permit completion of the furniture installation for a complete and usable facility to coincide with the Beneficial Occupancy Date (BOD) of this project. The furniture vendor/installer contract will include all electrical pre-wiring and the whips for final connection to the building electrical systems however; the general contractor shall make the final connections to the building electrical systems under this contract. Furthermore, the general contractor shall provide all Information/Technology (IT) wiring (i.e. LAN, phone, etc.) up to and including the face plate of all freestanding and/or systems furniture desk tops as applicable, the services to install the cable and face plates in the furniture, the coordination with the furniture vendor/installer to accomplish the installation at the appropriate time, and all the final IT connections to the building systems under this contract.

The Government reserves the right to change the method for procurement of and installation of furniture to Contractor Furnished/Contractor Installed (CF/CI). CF/CI furniture will require competitive open market procurement by the Contractor using the Furniture, Fixtures and Equipment (FF&E) package.

2.5. NOT USED

3.0 General Requirements

3.1 Scope

3.1.1 Aircraft Maintenance Hangar-Provide a rotary-wing aircraft operations and maintenance hangar. This project type is to provide facilities for the purpose of maintaining and repairing rotary-wing aircraft, complete with parts and tool storage, administrative operations, aviation (flying) operations, and all support equipment and facilities. It is intended for these facilities to be similar to aviation operations and maintenance hangars in the private sector community with the addition of administrative spaces.

Table 3.1 Approximate Net Square Footages

Building Section:	Sq. Ft.
Maintenance Shops & Offices	15,301
ALSE & Other Areas	4,500
Aviation Unit Operations	17,205
Aircraft Hangar Addition	36,826

Electrical Space included in 36,286

Telecommunications Space included in 36,286

Mechanical ties into existing hangar utilities

3.1.2 Government-Furnished Government-Installed Equipment (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCR's/TV's, all utility connections and space with required clearances for all GFGI items. All computers and related hardware, copiers, faxes, printers, video projectors, VCR's and TVs are GFGI.

The following are also GFGI items: facility data (e.g. routers, switches, modems) equipment, facility telephone switch equipment, associated equipment racks/cabinets, and any required UPS systems; radio transmitting equipment, racks/cabinets and associated antenna and wiring (Raceway to be provided by design); front end equipment and equipment racks associated with CATV/CCTV/Satellite TV, and separate front end audio equipment not associated with a Combined Mass Notification and Paging System.

3.1.3 Furniture Requirements-Provide furniture design for all spaces, including existing furniture and equipment to be re-used. Coordinate with the user to define requirements for furniture systems, movable furniture, equipment, existing items to be re-used, storage systems, etc. Early coordination of the furniture schedule is required so the facility is complete and useable at turnover. Furniture procurement is not included in this contract.

3.2 Aircraft Maintenance Hangar

3.2.1 General Requirements-Each hangar shall include administrative areas, aviation operations, maintenance areas, parts storage and maintenance shops co-located within one facility. The ideal site development maintains a comfortable and useful environment for both administrative and maintenance functions. Each site shall be designed in accordance with Antiterrorism Force Protection requirements. Each GSAB hangar consists of the following functional areas:

- Hangar Company Administrative and Readiness (Paragraph 3.3.1)
- Hangar Aircraft Maintenance; Hangar floor and shop space (Paragraphs 3.3.3 & 3.3.4)
- Support space (Paragraph 3.3.5)
- Aviation Unit Operations (Paragraph 3.3.6)

3.2.2 Accessibility Requirements-The addition will be accessible per the requirements of UFAs and ABA.

3.2.3 Army Standard Requirements and Project-Specific Requirements-The functional and technical requirements of Chapter 3 are specific to rotary wing hangars. The functional and technical requirements in Chapters 4 and 5 of this Section are requirements that apply to all Army projects. Functional and technical requirements unique to a specific project that add to, delete or modify these requirements in Chapters 3 through 5 shall be in the RFP for a specific project and shall fully take precedence over the requirements in Chapters 3 through 5.

3.2.4 Gross Building Area-Gross building area shall be as calculated by IBC, which is the area included within surrounding exterior walls exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above. Approximate area limits included in Table 3.1 are net square footages with calculated gross square footages. Net square footages do not include circulation space, wall partition thicknesses or mechanical/communication/electrical rooms.

3.2.5 Utility and Support Space-Mechanical, electrical and communications rooms shall be provided. Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and communications rooms shall be keyed separately for access by Installation maintenance personnel. Exterior access is required for mechanical and electrical rooms located on the 1st floor. All communications rooms shall be conditioned space equivalent to office space and with access to the facility from the interior of the building. Mechanical utilities will be obtained from the mechanical room in the existing hangar.

3.2.6 Office and Administrative Areas-Each administrative workstation is to include appropriate work surface area, upper cabinets or shelves, file cabinet(s), pencil drawer, space for computer and monitor, telephone, ergonomic administrative chair, and task lights. Provide centralized areas for photocopier, laser printer and fax machine with waste and paper recycling receptacles and supply cabinet for paper storage in each office area. Hours of operation are normal business day except where indicated otherwise.

3.2.7 Conference Rooms and Classrooms-Provide, as a minimum, a dry-erase whiteboard, a motor-operated projector screen, a ceiling-mounted projector bracket, a ceiling-mounted VAC receptacle and data receptacle in each conference/training and classroom of appropriate size.

3.2.8 Restrooms and Showers-Except where indicated otherwise, provide restrooms on each floor with fixture counts per IPC with fixture distribution calculated for 80% male and 20% female.

3.2.9 Janitor Closet-Provide, as a minimum, a janitor closet on each floor of each facility. Each janitor closet shall have a mop sink, mop rack and space for buckets, vacuum and storage for janitorial supplies.

3.2.10 Handicapped Access-The GSAB Hangar is to be handicapped accessible for civilian visitors, contract employees and Warriors-In-Transition that may be assigned. Provide one disabled accessible passenger elevator in facilities over one-story in height. Elevator cab must meet emergency ambulance requirements. (See Chapter 3.2.3 above.)

3.2.11 Oil-Water Separator System-The design of the separator system will account for the operational efforts of the fire protection system per ETL 1110-3-481.

3.3 Functional and Area Requirements:

3.3.1 Administrative Support Area-The company administration readiness area consists of offices, storage, etc., to accommodate personnel within the battalions. See Table 3.3 for net square footages for each type of administration/readiness space for the companies in each battalion. Where specified for workstation, provide 110 VAC receptacles, voice and data receptacle in addition to what may be specified in the table above.

3.3.2 Aircraft Maintenance Area-A consolidated multi-purpose space for the maintenance, repair, and major overhaul of military aircraft that includes maintenance bays, tech supply, shop space, production control, and quality control areas directly related to the maintenance and supervision of aircraft, component and assembly rebuilding, and quality control of aviation maintenance. The area can be broken down into two primary functions; aircraft

maintenance bay and shop space. See Table 3.3 for specific hangar function/space requirements and Table 3.4 for net square footages for each type of maintenance area space. Where a workstation is specified, provide 110 VAC receptacles, voice and data receptacle in addition to what is specified in the table above.

3.3.3 Aircraft Maintenance Shop-Aircraft maintenance shop space shall be sized based on sizes indicated in Table 3.4.

3.3.4 Aircraft Maintenance Support Space- Maintenance support spaces generally include storage rooms for maintenance tools, parts and POL materials. Maintenance support spaces shall be sized based on the sizes indicated in Table 3.4.

3.3.5 Aviation Unit Operations Area-Aviation Unit areas for pilots and air crews to prepare flight plans, mission planning and briefing/debriefing and work room. Aviation Unit spaces shall be sized based on the sizes indicated in Table 3.4.

Table 3.3-GASB Hangar Functional Requirements

Space:	GSAB Hangar Functional Requirements:	Personnel:
Aircraft Maintenance	<p>Provide the following consolidated multi-purpose space for the maintenance, repair, and major overhaul of military air craft and includes maintenance bays, tech supply, shop space, production control, and quality control areas directly related to the maintenance and supervision of aircraft, component and assembly rebuilding, and quality control of aviation maintenance.</p> <p>The area can be broken down into two primary functions, aircraft maintenance bay and shop space.</p> <p>Provide space for 5 UH/HH-60 and 4 CH-47 aircraft modules with safety lanes at perimeter of modules representing 25% of assigned aircraft per UFC 3-260-01.</p>	
Shop Spaces General Information	<p>Provide space required for maintenance function of the shop.</p> <p>Provide work surfaces, fixed storage bins for miscellaneous parts, supplies, and maintenance tool kits.</p> <p>Provide space for desks or modular work stations where required.</p> <p>Provide required utility connections-air, electrical, telephone/data lines, and water</p>	

where required.

Provide all shops with grate and drainage to Oil/Water Separator.

Provide eye wash at all shops. Emergency showers at shops where personnel are exposed to hazardous materials or POL.

Every shop requires pneumatic.

All shops require space for 1 work station with internet and Logistics STAMIS drops.

Tool storage preference for caged tool room for each shop for individual tool boxes and shop tools and test sets.

Partitions between shops to allow flexibility for future organizational/mission changes.

Production Control	Provide 2 semi-private offices with admin. work stations (Logistics STAMIS) separated from common work area.	11
	Provide space for 5 admin. Work stations (Logistics STAMIS) in a common work area.	
	Provide space for file storage, fax machine, and copier(s).	
	Provide progress/schedule marker board(s) or flat screen monitor(s).	
	Provide customer service counter restricting access to admin. area.	
	Provide open meeting space for 20 persons at conference type table integrated in the common work area.	
	Locate adjacent to Tech Supply and Logistics STAMIS comm. hub/server room.	
Quality Control/ Assurance	Provide semi-private office for OIC/NOIC with space for admin. Work stations (Logistics STAMIS).	13

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Provide customer service counter restricting access to the common admin. area. The counter shall have 3 Logistics STAMIS connections.

Provide admin. work station space for 11 personnel (2 of the work stations shall have Logistics STAMIS connections.)

Provide space for file storage, fax machine, and copier(s).

Provide progress/scheduling marker board(s) or flat screen monitor(s).

Locate adjacent to Production Control and Tech Supply.

Technical Assistance Representative (LARS/CLS)	Provide space for admin. work station for 5 personnel.	5
	Provide space for file storage, fax machine, and copier(s).	
	Locate adjacent to QC and PC.	

Structural Repair (Airframe)	Provide space for 1 admin. work station (Logistics STAMIS)	8
	Provide 6 bench height work stations with drawers/cabinets with power (1 Logistics STAMIS), and compressed air.	
	Provide space for GFGI: 48" box and pan break machine(s), 48" foot shear, shrinker/stretcher machine, 1 drill press.	
	Provide secure storage for shop tools.	
	Provide space above work stations for spray can painting and composite repair.	
	Provide clear-opening double doors or overhead roll-up door.	
	Provide work surface(s) to accommodate 1-6' x 8' stabilator.	

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Provide deep sink connected to an Oil/Water separator.

Provide space for repair or 1 rotor blade at-a-time with heated/cooled space.

Provide space for GFGI refrigerator for adhesive storage.

Provide space and power for conventional oven.

Provide space for 2 VIDMARS.

Pneudraulics
Repair

Provide separate shop-however, may be combined with Airframe. 3

Provide space for 1 admin work station (Logistics STAMIS)

Provide 2 bench height work stations with drawers/cabinets.

Provide separate secure storage for special tools and equipment.

Provide work space for large GFGI/GFCI equipment (e.g. bender).

Provide deep sink connected to Oil/Water separator.

Provide 1 compressed air connection per work station, and 110 VAC power in surface metal raceway. Provide containment/floor drain to Oil/Water separator.

Provide space for hose cutting saw(s), 1 GFGI solvent tank, and 2 VIDMARS. Provide secure Storage bins/racks for raw material (tubing and hoses).

Avionics/
Electrical
Repair

Provide 1 admin. work station (Logistics STAMIS). 15

Provide bench height work stations along 2 walls with 110 VAC power in surface metal raceways and equipment ground bar above bench

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height work stations.

Provide shelf above bench work stations for small parts box.

Provide 4 dedicated 28VDC outlets in surface metal raceway evenly distributed at bench height work stations.

Provide equipment grounding bar. Equip 1 bench height work station with 115 VAC/400 Hz 3-Phase power.

Provide for electrostatic discharge with either grounded wrist strips at work benches or grounded discharge plates at doors.

Provide local downdraft exhaust ventilation for soldering.

Provide space for 3 VIDMARS.

Provide rubber mats at bench height work stations.

Hangar Parts
TOE Storage
(Tech Supply)

Locate adjacent to Production Control, Aircraft Maintenance Bay floor and Exterior Storage. Provide issue and turn-in counters.

Provide private admin. work area with space for 2 admin. work stations.

Provide space for 1 common work station (Logistics STAMIS).

Provide shelving for parts, equipment, etc. (Automated storage systems preferred.)

Provide 10' wide X 12' high exterior overhead coiling door with dock access for the delivery of parts. Provide visual access to dock.

Special Tool
Room

Tool Room-Small Tools:
Provide centrally located secure room adjacent to hangar bay floor with customer service counter.

Provide space for 1 admin. work station

(NO Logistics STAMIS), VIDMARS, and shelving. Locate adjacent to Aircraft Maintenance Bay, Shops, and Maintenance Repair Sections. Provide doors large enough to move VIDMARS.

Equipment Storage:

Provide secured open floor space area for large equipment and tools (e.g. maint. stands, jacks, torque adapters, etc.)

Provide shelving (approximate 3' depth) for larger tools. The equipment storage shall be located adjacent to the Aircraft Maintenance Bay floor. Provide connection to small tools room for control. (A caged area inside the hangar is acceptable.)

Aviation Ops Unit	Provide space for administration, pilot briefing, pilot lockers, lounge, latrines, and storage for Air Life Support Equipment (ALSE)	Heavy-52 Command-37 Medical-85
Flight Planning	<p>Provide the following spaces for each of the flying companies unless noted otherwise: Provide battalion-level shared space.</p> <p>Provide 9 table-top planning work stations with power and NIPR drops.</p> <p>Provide 1 admin. work station. (Potential location for SIPR would require private office rather than cubicle.)</p> <p>Provide wall-mounted sliding panels for display of GFCI planning maps.</p> <p>Provide white boards.</p> <p>Provide shelving for manuals. Locate adjacent to briefing room and flight operations.</p>	
Secure Planning Room	<p>Provide space for 2 admin. work stations with secure voice, SIPRNET, and power.</p> <p>Provide secure access.</p>	
Flight	Provide battalion -level shared space. Provide	

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Operations	<p>space for 4 admin. work stations.</p> <p>Provide customer service counter restricting access to admin. work stations. (LAN/voice)</p> <p>Provide 1 Logistics STAMIS drop at the service counter.</p> <p>Provide conduit(s) for antennas to roof from 1 of the admin. work stations.</p> <p>Provide shelving for publications storage.</p> <p>Provide white boards and digital presentation capability.</p> <p>Provide secure storage for Night Vision Goggles (180 total). Locate adjacent to the Briefing Room and Flight Planning Room.</p> <p>Flight Line view is preferable. (CCTV could be an option.)</p>
Battalion-Level Pilot Briefing Room	<p>Provide 2 ceiling-mounted projector supports, 1 recessed ceiling-mounted screen, large white boards, and PA system.</p> <p>Provide space to accommodate 150 people utilizing stackable seating for briefing.</p> <p>Provides storage space for chairs and tables. Provide voce and data drops.</p> <p>Provide moveable lectern.</p>
Aviation Ops Breakroom	<p>Provide battalion-level shared break room with a small kitchen with microwave(s), refrigerator, and double sink.</p> <p>Provide space for seating 8-12 people at tables.</p> <p>Provide phone.</p> <p>Provide cable TV drop and wall-mount for TV.</p>
Crew Chief Workroom	<p>Provide company-level shop adjacent to air craft maintenance bay floor and Platoon</p>

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Sergeant's office.

Provide minimum 60 lf bench height, 24" deep counter with white board above with Logistics STAMIS and power to accommodate 20 lap tops.

Provide means to secure 2 individual tool boxes (kits) per 3 lf of counter.

Provide 4' X 8' bench height work table with metal surface. Locate in center of room. Provide space for 8 VIDMARS and bench stock.

ALSE Lockers

Provide 220 dual lock or pass-through ALSE lockers (approximately 2.5' X 2.5' X 2.5') for flight crew members.

Locate immediately accessible to ALSE Shop.

ALSE Shop

Provide minimum 6' customer service counter. Provide space for 1 admin. work station. Provide space for training (approx. 12' X 16"). Provide separate space for a refrigerator, washing machine, and dryer with storage shelves. Provide secure area with: 2-8' work benches, with rubber top for inspection and maintenance, floor-to-ceiling shelving for storage of ALSE and related equipment, 2-4' X 8' non-porous work tables free from rough or abrasive materials, and 4 lockers. Provide a utility support area for a fixed or portable vacuum source and a low-pressure, high-volume, compressed air (moisture and oil-free). Locate adjacent to ALSE lockers. Preferred location is on the 1st floor.

Restrooms

Provide separate restroom space for administrative personnel.

80% male and 20% female of admin. personnel.

Showers- Administrative Personnel

May be adjacent to administrative restrooms and/or integrated with showers/latrines for maintenance personnel.

Provide personal lockers (12" X 72") with raised

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base and sloped top for administrative personnel at conclusion of Physical Training. (Approximately 1/2 of assigned personnel.)

Provide benches.

80% male and 20% female of admin. personnel.

Showers and
Latrines
Maintenance
Personnel

Provide required showers/latrine fixtures to accommodate maintenance personnel in the Aviation Maintenance or Support Company.

Provide personal lockers (12" X 72") for maintenance personnel. Provide benches.

May be adjacent to admin. personnel.

80% male and 20% female of maintenance personnel.

Support Spaces
Mechanical

Include space for sprinkler system riser, fan motors, boilers, etc. with adequate maneuverability to service equipment.

Electrical

Provide space for service-rated entrance equip., transformers, distribution panels, fire alarm system control, etc.

Communications

Telephone and data racks and distribution equip. (Including future accommodation for SIPRNET) with 4 work stations and associated equipment.

Janitor Closets

Minimum of 1/floor, centrally located.

Corridors/Halls

Minimum width to be 6'-0".

3.4 Room Summary Matrix

3.4.1 Functional Spaces-Net area requirements for functional spaces are included in Table 3.4. The gross area space shall be sized to accommodate the required function, comply with code requirements and other requirements of the facility.

Table 3.4 Hangar Addition Functional Spaces

ROOM NAME:	AREA (SF):	SPECIAL REQUIREMENTS:
Maintenance Shops & Offices		
Powertrain Shop (Prop/Rotor)	847	8' x 10' Overhead Door to Hangar
Structural Shop (Airframe/Composite/Sheet Metal)	1,612	8' x 10' Overhead Door to Hangar
Avionics	621	Double Swing Doors From Hangar
Pneudralics	599	Double Swing Doors From Hangar
Electrical	309	Double Swing Doors to Exterior
Power Plant (Engine)	887	8' x 10' Overhead Door to Hangar
Armament Subsystem	621	Double Swing Doors to Hangar
Production Control	594	
Quality Assurance/Quality Control	621	
Technical Supply/Library	765	8' x 10' Overhead Door to Hangar
Contractor Logistics Support (CLS)	592	Double Swing Doors to Exterior
UH-60 Repair Section Workroom	405	Double Swing Doors to Hangar
UH-47 Repair Section Workroom	756	Double Swing Doors to Hangar
Communications	93	
SIPR	126	
NIPR	126	
Elevator w/ Equipment Room		
Tool Room	558	Double Swing Doors to Hangar
Repair Parts Storage Room	621	
COMSEC Storage	308	
Bench Stock Storage	120	
Arms Vault (Aircraft Mounted)	287	
Contractor Logistics Support	588	
1st Sergeant (4 EA.)	734	
Classified Storage Vault	95	
ALSE Administration Area	150	
ALSE Maintenance Shop	1,000	
ALSE Storage (195 Lockers)	3,200	
Pilot Work Room-A	1,180	
Pilot Work Room-B	1,169	

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Pilot Work Room-C	1,188
Flight Planning	1,031
Briefing Room	1,006
Classified Storage Vault	95
Safety Standard Office	535
Flight Operations	594
Crew Chief Room-A	675
Crew Chief Room-B	729
Crew Chief Room-C	640

ROOM NAME:	AREA (SF):	SPECIAL REQUIREMENTS:
Break Room	546	Alcove area off of a corridor as an assembly room with cabinets, countertop, sink, and space for a refrigerator (NIC).
Toilets/Showers	1,839	Includes toilets for administrative and maintenance personnel. Showers to accommodate maintenance and off-post personnel (25% non-maintenance population) Quantities based on 80% male and 25% female.
Facility Maintenance & Storage Janitor Closet	1,000	
Medivac Readiness	1,945	
Miscellaneous Hallways/Stairs		

3.5 General Technical Requirements

3.5.1 Site-Site selection and real property master planning for all active component HGR Complexes (and Reserve Component complexes where applicable) shall comply with all safety, obstruction, and airspace boundaries as stipulated by AR 95-2 and implemented by the Transportation Systems Mandatory Center for Expertise (TS MCX) for DCS G-3, HQDA. The major components of a HGR Complex and minimum siting requirement for any hangar project (inside the 5 foot line) includes the primary facility FCC 211 xx, Hangar Access Apron FCC 113 40, and Aircraft Wash Apron FCC 113 70. ASB hangars also include Aircraft Parts Storage Building FCC 211 13 external storage space allocations. All other hangar complex space is contained within the confines of these facility categories.

The outer boundary of the hangar complex (outside the 5 foot line) abuts the Rotary Wing Aircraft Parking Apron FCC 113 20, Hover Taxi lanes FCC 112 21, and Taxiways FCC 112 31. This assures safe and efficient transition

from the power-on components of an AAF/AHP (primary landing surface, i.e. runway or helipad, and aircraft parking) to non-power ingress/egress into the hangar.

3.6 Architecture and Interior Design

3.6.1 General-The overall architectural goal is to provide a functional, visually appealing facility that is a source of pride for the Installation and delivered within the available budget and schedule.

3.6.2 Building Exterior-Design building to enhance or compliment the visual environment of the Installation. Where appropriate, reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain.

3.6.2.1 Building Numbers-Each building shall have exterior signage permanently attached on two faces of the building indicating the assigned building number or address.

3.6.3 Building Interior

3.6.3.1 Space Configuration-Arrange spaces in an efficient and functional manner in accordance with area adjacency matrices.

3.6.3.2 Surfaces-Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.

3.6.3.3 Color-The color, texture, and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordination of the building colors and finishes is necessary for a cohesive design. Color selections shall be appropriate for the building type. The use of color, texture, and pattern shall be used to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Finishes should be selected with regards to aesthetics, maintenance, durability, life safety, and image. Limit the number of similar colors for each material. Color of ceramic and porcelain tile grout shall be medium range to help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked, or speckled. Finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms/warning lights, emergency lighting, and other miscellaneous items shall be coordinated with the building interior. Color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) shall match the ceiling color.

3.6.3.4 Circulation-Circulation schemes must support easy way finding within the building.

3.6.3.5 Signage-Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plans set shall be from one manufacturer and shall include the following sign types: (1) Directory, (2) Directional signs, (3) Room identification signs, (4) Building service signs, (5) Regulatory signs, (6) Official and unofficial signs, (7) Visual communication boards. Use of emblems or logos may also be incorporated into the signage plan.

3.6.3.6 Window Treatment-Treatment shall be provided in all exterior windows or locations where control of day light coming in windows or privacy at night is required. Uniformity of window covering color and material shall be maintained to the maximum extent possible with the building.

3.6.4 Material and Finishes

3.6.4.1 Floors:

(a) Shop Floors shall be sealed concrete, non-skid, light-reflective, non-oxidizing dry-shake surface hardener or light-reflective epoxy or polyurethane coating.

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- (b) Restroom Floors shall be ceramic or porcelain tile.
- (c) Shower Floors shall be ceramic tile.
- (d) Office Floors shall be carpet or vinyl composition tile.
- (e) Corridors and Vestibule Floors shall be vinyl composition tile.
- (f) Other auxiliary spaces shall have concrete sealer.

3.6.4.2 Bases:

- (a) Shop Spaces shall have painted CMU/rubber base.
- (b) Restrooms shall have ceramic or porcelain tile.
- (c) Showers shall have ceramic tile.
- (d) Offices, corridors and vestibules shall have rubber base.
- (e) Other auxiliary spaces shall have rubber base.

3.6.4.3 Walls-STC and fire-rated where required.

- (a) Shop Spaces-Up to 10'-0" above finished floor shall be durable, impact-resistant, and corrosive-resistant and easily cleaned material. The lower portion of the walls is to be protected against incidental damage caused by movement of aircraft parts, equipment, etc. Exterior surface is to be protected against incidental damage. Painted. Above 10'-0" shall be moisture-resistant gypsum board, exposed vinyl.
- (b) Restrooms-Shall be ceramic or porcelain tile. (Utilize water-resistant/mold-resistant cement board backer board.)
- (c) Showers-Shall be ceramic or porcelain tile. (Utilize water-resistant/mold-resistant cement board backer board.)
- (d) Offices-Shall be painted gypsum board.
- (e) Corridors and Vestibules-Shall be painted gypsum board.
- (f) Other Auxiliary Spaces-Shall be Painted gypsum board or CMU.

3.6.4.4 Ceilings:

- (a) Shop Spaces-Unless otherwise noted or Code required shall be painted, exposed structure. Note: If used, exposed, vinyl-faced insulation is not to be painted.
- (b) Offices and Technical Shops-Shall be acoustical ceiling tile.
- (c) Restrooms and Lockers-Shall be moisture-resistant acoustical tile.
- (d) Showers and Lockers-Shall be painted, moisture-resistant gypsum board.
- (e) Corridors-Shall be acoustical ceiling tile.
- (f) Vestibules-Shall be acoustical ceiling tile with hold-down clips or painted gypsum board.
- (g) Auxiliary Spaces-Shall be acoustical ceiling tile or painted gypsum board.

3.6.4.5 Doors/Frames: (STC and fire-rated where required)

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- (a) Painted, insulated, galvanized, hollow metal (corrosive-resistant at hangar and shop areas).
- (b) Plastic laminate, hollow core metal, insulated metal, or solid core, wooden doors. (administrative spaces)
- (c) Service Doors-Shall be insulated metal, motorized, overhead coiling doors.
- (d) Folding Partitions-Shall be manually operated, vinyl, pantograph acoustical folding partitions. Provide a minimum 42 STC rating, or
- (e) Movable wall panels-Single or paired panels. Provide a minimum 42 STC rating. Provide hinged doors in panels where access through the movable wall is required for function or code.

3.6.4.6 Windows/Glazing (Fire-rated where required):

- (a) Shop Spaces-Shall be fixed, high-bay windows, clerestory windows, or insulated translucent wall system where required.
- (b) Offices Exterior and Vestibule Interior-Shall be aluminum, insulated windows, fixed- color PVF finish.
- (c) Interior Windows-Shall be hollow core metal with fire or safety glazing as required.

3.6.4.7 Specialties:

- (a) Marker Boards-Shall be liquid writing marker boards.
- (b) Bulletin Boards-Shall consist of natural cork tack board and aluminum tubular frame.
- (c) Signage-Shall comply with requirements of ABA and UFAS. Interior signage shall be fully integrated as a design element with the architecture and interior design.
- (d) Fire Extinguishers-Shall be mounted in cabinets or supports.
- (e) Millwork-Built-in accessories/work shops/counters.

3.6.5 Comprehensive Interior Design

3.6.5.1 Comprehensive Interior Design (CID)-CID includes the Structural Interior Design (SID) and the Furniture, Fixtures, and Equipment (FF&E) design. SID requires the accommodation of required FF&E within the building and the design, selection and coordination of interior finish materials that are integral or attached to the building structure. The SID provides basic space planning for anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. Completion of an SID involves the selection and specification of applied finishes for the building's interior features including, but not limited to, walls, floors, ceilings, trims, doors, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package will include furniture floor plans, finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build-out. The FF&E includes the design, selection, specification, color coordination and procurement documentation of the required items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility. The FF&E package will include the placement plans, ordering and finish information on all freestanding furnishings and accessories, and cost estimates and will be coordinated with the SID interior finish materials. The selection of furniture style, function and configuration will be coordinated with the defined requirements. Examples of FF&E items are work stations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards and presentation screens. Criteria for furniture selection will include function and ergonomic considerations, maintenance, durability, sustainability, comfort and cost. SID is required for all facility types. FF&E package is required.

3.6.5.2 Color, Surface and Signage-Provide a signage package for all reception desks if not provided for in the building's overall signage package.

3.7 Structural Design

3.7.1 Standards and Codes-The structural design shall be in conformance with the current version of the unified Facilities Criteria, "UFC 1-200-01 Design: General Building Requirements", and other relevant codes and criteria listed in "Applicable Criteria", Chapter 4.

3.7.2 General-The structural system needs to be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Select an economical structural system based on facility size, projected load requirements and local availability of materials and labor. The structural design shall be based on accurate, site-specific geotechnical information and anticipated loads for the building type and geographic location.

3.7.3 Structural Loads-Structural loads (including dead, live, hydrodynamic, earth, vehicular, snow, wind, seismic loads, crane loads and ATFP) and design shall be in accordance with "UFC 1-200-01 Design: General Building Requirements" and all codes referenced in Chapter 4-Applicable Criteria.

3.8 Plumbing

3.8.1 Exterior Wall Hydrants-Wall hydrants shall be provided around the perimeter of the building per UFC 3-600-01 and NFPA requirements.

3.8.2 Domestic Hot Water System-The main water heating equipment shall be located within a mechanical room, and also located on the ground floor level only. Instantaneous water heaters are permissible. System storage and recovery shall be sized for delivery of hot water at every shower head over a continuous operation of all heads for duration of 90 minutes. Usage diversity factor for the showers shall be one. Size water heater(s) based upon usage anticipated and accounting for this diversity factor. The energy source for all domestic water heating systems shall be determined by a Life Cycle Cost Analysis.

3.8.3 Trench Drains-Design trench drains for easy cleaning. Provide basket strainers to facilitate trash removal where trench drains discharge to piping systems. Convey waste to exterior oil/water separator prior to discharge to the sanitary sewer system. Where a dedicated, walled welding area is provided, provide a solid cover to the trench drain where it runs through the welding area.

3.8.4 Emergency Showers and Eyewashes-See Paragraph 5 for eye wash, hand wash, and emergency shower requirements within the hangar and shop areas. Locate emergency wash stations in accordance with OSHA Standards 1910.151(c) and ANSI Z358.1.

3.8.5 Compressed Air-Provide the compressed air outlets with quick disconnect couplings in all structural bays. Each drop shall include an isolation valve, filter, pressure regulator, and a condensate trap with drain cock. Provide an air compressor with receiver, refrigerated air dryer, filtration, and pressure regulation. The air compressor shall be installed building equipment. Size the air compressor for 30 SCFM per outlet, with a 60% diversity, plus any additional compressed air equipment in the facility. Unless otherwise indicated by the user requirements, provide compressed air at 120 psi.

In AH-64 bays, provide regulators that provide service at 40 psig.

3.9 Electrical and Telecommunications

3.9.1 Facility Power-Facility power shall be designed in accordance with NFPA 70. At a minimum, the facility shall be provided with the following: 3-phase, wye-connected, underground secondary service rated at 480VAC, with sufficient capacity for future growth. 480VAC will be utilized for mechanical equipment and larger, building-specific loads, such as 400HZ converters, and 28VDC rectifiers. Generally, 277VAC will be utilized for lighting. Dry-type step down transformers will be utilized to provide 208Y/120VAC service for miscellaneous loads. 200Y/115VAC, 400HZ power convertor(s) and 28VDC rectifier(s) will be provided to support A/C maintenance

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functions in the shop areas as well as in the hangar bay. Exterior loads may vary by site and must also be considered for each project. Some of the following should be considered: any airfield lighting or taxiway requirements, exterior facility lighting, power connections for exterior ground support equipment, or portable trailers. As many as 9 trailers, each utilizing 208Y/120VAC, 100A, 3-phase service may require power from the facility distribution system. Coordinate project-specific requirements for the trailers and their load and connection requirements. Specific load requirements for the hangar and shop areas will vary by airframe type and specific shop equipment and hangar-type design. Careful coordination will be required to size incoming service appropriately based upon the type and number of aircraft. Utilize an appropriate diversity factor for sizing 400HZ and 28VDC conversion equipment. Use Table 3.9 for consideration.

Table 3.9

Ground Service:		Aviation Platform Ground Service Baseline Requirements						
		AH-64A:	AH-64D:	UH-60A/L:	UH/MH-60M,X:	CH-47D:	CH/MH-47E,F,G:	OH-58D:
400HZ	28kW	34.4kVA	45kVA	45kVA	20kVA	40kVA	10kVA	
200/115V	(35kVA)	93kVA (270A for 0.014 sec.)						
28VDC Start	None	None	None	None	None	None	500-750 A start	500-800 A start
28VDC Servicing	None	None	None	None	200A Servicing	200A Servicing	200A Servicing	200A Servicing
Hydraulic Start	None	None	None	None	16.5 gpm @ 3350 psig	16.5 gpm @ 3350 psig	None	None
Hydraulic Servicing	6 gpm @ 3000 psig dual system	6 gpm @ 3000 psig dual system	8 gpm @ 3000 psig triple system	8 gpm @ 3000 psig triple system	10 gpm @ 3000 psig triple system	10 gpm @ 3000 psig triple system	3 gpm @ 3000 psig single system	2.4 gpm @ 1000 psig
Pneumatic Start	30 lb/min @ 30-50 psig	30 lb/min @ 30-50 psig	30 lb/min @ 30-50 psig	30 lb/min @ 30-50 psig	None	None	None	None
Pneumatic Servicing	ECU PAS hyd Press	PAS only	None	None	None	None	None	None

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3.9.2 Standby Power Systems-Standby generator and UPS backup power systems generally will not be required for these facilities. GFGI UPS systems may be considered for communication and data systems but will generally not be large in nature and will not be provided by the design.

3.9.3 Grounding-The grounding counterpoise around the building perimeter will be utilized for grounding incoming service, building steel, telephone service, piping, lightning protection, aircraft static, ground points, and facility internal grounding requirements (e.g. shop areas). Ground straps will be provided where required by function and will be connected to the building grounding system. A grounding point will be provided under each raised access floor. Additional grounding may be provided based on project-specific requirements and US Army I3A Guide.

3.9.4 Lightning Protection-Lightning protection generally will be required for all facilities and shall be designed in accordance with NFPA 780 Annex L and Chapter 4, and TB 385-4.

3.9.5 Power Distribution-Power receptacles will be provided per NFPA 70 and in conjunction with proposed equipment and furniture layouts. 110VAC power will be required at each work station in the office and shop areas. In addition, work stations in the hangar bay and shop areas will require consideration for 200/115VAC, 400HZ, 28VDC as well as 110VAC/60HZ.

3.9.6 Lighting-The exterior and hangar bay lighting shall be compatible with any future security cameras and security requirements as applicable. Interior lighting controls shall be provided in accordance with ASHRAE 90.1. Local manual controls shall supplement automatic controls in offices and specialized areas such as conference rooms. Occupancy sensor controls shall be provided in rest rooms, electrical rooms, telecommunications rooms and similar spaces. Interior ambient illumination shall provide a generally glare-free, high-quality lighting environment.

3.9.7 Telecommunications

3.9.7.1 General-The facility shall be connected to the Installation-Wide Area Network (WAN) system and telephone system. Communications system resources will be allocated in accordance with I3A Technical Criteria regarding outlet amounts based on the functionality of the facility's various component floor spaces. Design will be in accordance with the I3A Technical Criteria.

3.9.7.2 An acceptable building communications cabling system encompasses, but is not limited to, copper and Fiber Optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and/or fiber horizontal distribution cable, work station outlets, racks, cable management, patch panels, cable tray, cable ladder, grounding, and labeling. Telecommunications outlets will be provided per the I3A Technical Criteria based on functional purpose of the various spaces within the facility as modified by user special operational requirements. Telecommunications infrastructure will meet the Installation Information Infrastructure Architecture (I3A) Criteria and ANSI/TIA/EIA requirements.

3.9.7.3 Voice/Data Outlets-Voice/data outlets shall be two 8-pin modular (RJ 45 Type) outlet/connector in a double gang outlet pace plate, one connector labeled voice use and one labeled data use. Copper outlet/connector must be TIA/EIA Category 6 for all projects. All connectors must be 8-pin/8-position insulation displacement terminations wired per T568A (default configuration). One Cat 6 UTP cable must be installed to each standard 8-pin modular connector provisioned at the face plate. Copper distribution cable must be terminated at the TR on Cat 6 cabinet or rack-mounted patch panels with 110-type compliant connectors on the back and 8-pin modular connectors on the front. Provide wireless access point (WAP) outlets in the hangar bay areas with one-Cat 6, unshielded twisted pair (UTP) cable, each to a standard 8-pin modular connector for each wireless WAP outlet. Provide a minimum of one WAP outlet in each aircraft module.

3.9.7.4 Outside Plant Telecommunications Systems-The project's facilities must connect to the Installation telecommunications (voice and data) system through the outside plant (OSP) underground infrastructure per I3A guidance. Connections to the OSP cabling system shall be from each facility main cross connect located in the main telecommunications room or telecommunications equipment room closest to the OSP access point. Components include the physical cable plant and the supporting structures. Items included under OPS infrastructure encompass, but are not limited to, maintenance hole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, splices, cable vaults, and copper and FO entrance facilities.

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3.9.7.5 Telecommunications Rooms (TR)-Telecommunications rooms and telecommunications entrance facilities must be provided for unclassified network and voice equipment and cabling infrastructure throughout the facilities. There shall be a minimum of one telecommunications room on each floor, located near the center of the building, and stacked between floors. The telecommunications rooms will be designed and provisioned in accordance with the I3A Technical Criteria and ANSI/EIA/TIA-569-B. One telecommunications entrance capability shall be provided for each facility. The telecommunications entrance may be collocated with the main TR for the facility. TR's shall be sized for the area supported. TIA/EIA-569-B compliant Telecommunications Enclosures (TE) may be used for hangar areas where horizontal cable distance exceeds 90 meters.

3.9.7.6 SIPRNET-Provide a SIPRNET room as indicated on the facility drawings for future use. Refer to the USAISEC Technical Guide for the Integration of Secret Internet Protocol Router Network (SIPRNET) for detailed information and references regarding SIPRNET. Section 6.2.5 of the USAISEC SIPRNET Tech Guide provides guidance on physical security. The SIPRNET room will be a minimum of 6' X 6', constructed in accordance with AR 380-5, Section III, Chapter 7. The room requires an intrusion detection system. The SIPRNET tech guide recommends a steel entrance door, with a CD-X09 lock, minimum width of 32" to accommodate a cabinet, if necessary. Connect the SIPRNET room to the main telecommunications room via a single 2' trade-size steel conduit. Provide a 20A branch circuit for future equipment. Ventilation ducts are to be barred per the security requirements of AR 190-11 App. G.

3.9.7.7 CATV-Provide a completely operational CATV cabling system including, but not limited to, all necessary raceways, cabling, terminations, jacks, and face plates. The horizontal cable for the CATV system will be RG-6 with "F"-type connectors on the terminal end. The CATV cabling will be terminated on splitters in the telecommunications room, or in a location indicated by NEC. CATV riser cable will be RG-11 type. Splitters will be located on the CATV backboard. Service requirements to the building will be coordinated with the local CATV service provider. At a minimum, provide one-4" empty conduit stubbed out of the building to facilitate the CATV entrance.

3.9.7.8 Each utility space, such as mechanical, electrical and telecommunications room will be provided with at least one wall-mounted telecommunications outlet, with a wall mounting lug face plate near the entrance door.

3.9.7.9 Miscellaneous Systems-Secure Access Systems, Intrusion Detection Systems (IDS), and Closed-Circuit Television (CCTV) shall typically be designed to only provide raceways and back boxes for installation of these systems. Project-specific requirements must be coordinated.

3.9.7.9.1 Coordinate anticipated locations of devices and provide raceways and back boxes for installation of a secure system per "Army Installation Design Standards", paragraph 3.5.11, "Locks and Locking Devices".

3.9.7.9.2 Coordinate anticipated locations of devices required for a complete IDS and CCTV system. The design shall provide raceways and back boxes for installation of a complete system.

3.9.8 Fire Alarm Detection and Notification-Provide a complete detection and notification system that is able to interface with all facility fire protection systems, including, but not limited to, the Hangar Suppression System, Fire Pumps, Mass Notification System, and Installation Fire Station. Design will be in accordance with NFPA 72, UFC 3-600-01, ETL 1110-3-485 and the local authority having jurisdiction. See section 5.10.3 for additional requirements.

3.9.9 Mass Notification and Paging System-Provide a mass notification system in accordance with UFC 4-021-01 in administrative spaces. Hangar bay areas shall comply with exterior criteria. Provide the speakers, raceways, and back boxes for a complete paging system. Typically, amplifiers and preamplifiers are provided separately. In some instances, it may be more efficient to specific project to design and integrated Fire Alarm, Mass Notification and Paging System. Specific project requirements will determine.

3.10 Heating, Ventilating and Air Conditioning (HVAC)

3.10.1 Standards and Codes-The HVAC system shall conform to Applicable Criteria in Chapter 4.

3.10.2 Administrative Areas-See Table 3.10 for heating and cooling of administrative areas. HVAC system design should consider including flexibility in zoning to where it can address future changes in occupant densities. Administrative areas shall be temperature-controlled by the DDC System. Temperature set point adjustment shall be accomplished via DDC System by authorized personnel. Consider all viable alternative systems meeting the functional requirements of the hangar bays.

3.10.3 Shop Areas-The shops shall be mechanically ventilated, heated, and air-conditioned. Consider packaged equipment, split systems, or systems utilizing chilled/heating water from either a central plant or decentralized sources. Independent and dedicated packaged A/C units shall be provided for the Arms Vault and Non-Sensitive Secure Storage Areas. Communication rooms will be served by an independent and dedicated air-handling system and shall be conditioned. Air handling unit system(s) shall not be floor-space mounted within the actual spaces served. Administrative-type areas located within the shops will be conditioned per Paragraph 5 requirements.

3.10.4 Building Exhaust Systems-Provide exhaust systems at heat sources, rest rooms, battery rooms, and contamination sources. Battery room systems (SLAB battery system) will be ducted exhaust systems with explosion-proof fans in accordance with the appropriate TI requirements. Exhaust systems will be operated continuously while the building is occupied. Exhaust systems shall be in accordance with NFPA 30 and NFPA 30A.

3.10.5 Design Conditions

3.10.5.1 Design shall be based on weather data from recognized and authoritative sources weather data. Indoor design conditions shall conform to Table 3.10. Indoor air quality shall conform to the current ASHRAE Standard 62.1 and OSHA requirements.

Table 3.10 Indoor Design Data

Heating:	
Indoor Design Temperature	70 Degrees F
Unoccupied Space Design Temperature	55 Degrees F
Cooling:	
Indoor Design Temperature	75 Degrees F
Unoccupied Space Design Temperature	85 Degrees F

3.10.5.2 In geographical areas of high humidity, take appropriate measures to control moisture. In areas of high humidity, provisions will be made for cure rooms/spaces to have dehumidification procedures to bring ambient relative humidity in the cure rooms/spaces down to 40% relative humidity to allow for acceptable cure times.

3.10.5.3 To prevent mold formation in buildings, air-conditioning systems must be designed to maintain space humidity at reasonable levels. Include the following considerations in the design of the air-conditioning systems. Avoid over-sizing of cooling equipment. Design single-zone systems and multi-zone systems to maintain an indoor design condition of 50% relative humidity. Size cooling coils for the greater of the cooling load calculated at the design dry bulb temperature condition or the design humidity condition. Where fan coil units are used, provide a non-permeable wall covering behind the unit. Provide ventilation air from a separate, dedicated air handling unit. Do not condition outside air through fan coil units. Avoid the use of direct expansion cooling coils in air handling units with constant running fans that handle outside air.

3.11 Building Automation System

3.11.1 General-The Building Automation System (BAS) shall be a single, complete, non-proprietary Direct Digital Control (DDC) system for control of the Heating Ventilating and Air Conditioning (HVAC) and other building systems. The BAS shall be based on an open implementation of BACNET technology using ANSI/CEA 709.1B as the communications protocol and use only BACNET Standard Network Variable Types as defined in the BACNET Resources Files for communication between the DDC hardware devices to allow multi-vendor interoperability. The

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building BAS shall include integration to a base-wide supervisory monitoring and control (M&C) system (often referred to as a Utility Monitoring and Control System-UMCS) as defined in the RFP.

3.11.1.1 The system shall be open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original Contractor. This includes, but is not limited to the following:

(a) Install hardware such that the individual control equipment can be replaced by similar control equipment for other equipment manufacturers with no loss of system functionality.

(b) Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the contractor.

3.11.1.2 All DDC Hardware shall:

(a) Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.

(b) Communicate over the control network via ANSI/CEA 709.1B exclusively.

(c) Conform to the BACNET Interoperability Guidelines.

(d) Be locally powered; link power (over control network) is not acceptable.

(e) Be fully configurable via standard network or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (NCI), or hardware settings on the controller itself to support the application.

(f) Provide input and output SNVT's required to support the application and supervisory monitoring and control functionality such as system start/stop and overrides.

(g) To the greatest extent practical, not rely on control network to perform its control loop functions.

3.11.1.3 BACNET Certified DDC hardware devices and those with BACNET plug-ins are preferred.

3.11.1.4 Gateways may be used provided that each gateway communicates with and performs protocol translation for hardware controlling one and only one package unit.

3.11.1.5 If there is not an existing UMCS that meets the following requirements, provide one:

(a) The UMCS shall perform supervisory control and monitoring of base-wide ANSI/CEA-709.1B (BACNET) network using BACNET Network Services. The UMCS shall maintain the LNS database(s) for the entire network.

(b) The UMCS shall include a 100Mbps (minimum) IP network installed in one of the following methods:

(1) Share existing base-wide IT LAN operated by NEC.

(2) Use spare existing IT infrastructure to install a physically independent IP network.

(3) Install all new networking.

(c) Coordinate installation of this network with NEC.

(d) The monitoring and control (M&C) software shall be BACNET Network Services-compatible client server software package that performs supervisory monitoring and control functions including, but not limited to, Scheduling, Alarm Handling, Alarm Generation, Trending, Report Generation, and Electrical Peak Demand Limiting. The software shall be expandable in both number of points and number of clients supported in order to

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support system expansion. The M&C software may include drivers to other (non-ANSI/CEA-709.1B) protocols. In addition:

(1) It shall incorporate a programming (scripting) language capable of reading and writing data as Standard Network Variable Types (SNVTs) that can be used for creating custom applications.

(2) It shall be capable of scheduling SNVTs such that it can change the value of a SNVT according to an internal schedule.

(3) It shall be capable of handling alarms by providing an alarm notification via a pop-up to a user display, printing to a printer, sending an e-mail and sending a numeric page.

(4) It shall include a Graphical User Interface which allows for hierarchical graphical navigation between systems, graphical representations of systems, access to real-time data for systems, ability to override points in a system, and access to all supervisory monitoring and control functions. Each system display shall clearly distinguish between the following point data types and information: Real-time data, User-entered data, Overridden or operator-disabled points, Device in alarm (acknowledged), and Out-of-range, bad, or missing data. The software shall allow the user to create, modify and delete displays and graphic symbols.

(e) Provide a network configuration tool. This software shall use BACNET Network Services for all network configuration and management of ANSI/CEA-709.1B devices, be capable of executing LNS plug-ins, and be capable of performing network data base reconstruction of an ANSI/CEA-709.1B control network.

3.11.1.6 Perform all necessary actions needed to fully integrate the building control system to the UMCS. These actions include, but are not limited to:

(a) Install IP routers or ANSI/CEA-852 routers as needed to connect the building control network to the UMCS IP network. Routers shall be capable of configuration via DHCP and use of an ANSI/CEA-852 configuration server but shall not rely on these services for configuration. All communications between the UMCS and the building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852. Any IP network work including access to existing networks shall be coordinated with NEC.

(b) Configure M&C software functionality including: graphical pages for system graphic displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.

3.11.1.7 Provide the following upon acceptance of the system:

(a) The latest version of all software and user manuals required to program, configure and operate the system.

(b) Points Schedule drawing that shows every DDC hardware device. The Points Schedule shall contain the following information as a minimum:

(1) Device address and Node ID.

(2) Input and Output SNVTs including SNVT name, type, and description.

(3) Hardware I/O, including type (AI, AO, BI, BO) and description.

(4) Alarm information including alarm limits and SNVT information.

(5) Supervisory control information including SNVTs for trending and overrides.

(6) Configuration parameters for devices without LNS plug-ins.

(c) Riser diagram of the network showing all network cabling and DDC hardware. Label hardware with IP addresses, ANSI/CEA-709.1B addresses and network names.

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- (d) Control system schematic diagram and sequence of operation for each controlled system.
- (e) Operation and maintenance instructions, including procedures for system start-up, operations and shut-down, a routine maintenance checklist and a qualified service organization list.
- (f) BACNET Network Service database for the completed system.
- (g) The contractor's quality control organization shall complete the following checklist.

Table 3.11-Quality Control Checklist

Instructions: Initial each item, sign and date verifying that the requirements have been met.

#:	Description:	Initials:
1	All DDC hardware is installed on a TP/FT-10 local control bus.	_____
2	Communications between DDC hardware is only via EIA 709.1B using SNVTs. Other protocols and network variables other than SNVTs have not been used.	_____
3	All sequences are performed using DDC hardware.	_____
4	BACNET database is up-to-date and accurately represents the final installed system.	_____
5	All software has been licensed to the Government.	_____
6	Final as-built drawings accurately represent the final installed system.	_____
7	O&M instructions have been completed and submitted.	_____
8	M&C software monitoring displays have been created for all building systems, including all override and display points indicated on Points Schedule drawings.	_____
9	Connections between the UMCS IP network and ANSI/CEA-709.1B building networks are through ANSI/CEA-852 routers. Complete Item 10 if new M&C software was provided.	_____
10	M&C software is BACNET Network Services based and uses LNS for interfacing to ANSI/CEA-709.1B networks.	_____

By signing below I verify that all requirements of the contract, including but not limited to the above, have been met.

Signature: _____ Date: _____

3.11.1.8 The Contractor shall perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. The PVT shall demonstrate that the system performs as specified, including, but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

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3.11.1.9 Provide a one year unconditional warranty for the installed building automation system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.

3.11.1.10 Provide training at the project site on the installed building automation system. Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

3.12 Testing, Adjusting and Balancing (TAB)-Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), Testing, Adjusting, and Balancing Bureau (TABB). Perform TAB in accordance with the requirements of the standard under which the TAB's firm qualifications are approved, i.e. AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB standard for all aspects of TAB, including qualifications for the TAB firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB standard, adhere to the manufacturer's recommendations. All quality assurance provisions of the TAB standard such as performance guarantees shall be part of this Contract. For systems or system components not covered in the TAB standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

3.13 Commissioning-Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Fundamental Commissioning, in accordance with the ASHRAE Guideline for the Commissioning Process and LEED. The Contractor shall hire the Commissioning Authority, certified as a Commissioning Authority by AABC, NEBB, or TABB, as described in the ASHRAE Guideline for the Commissioning Process. The Contracting Officer's Representative will act as the Owner's Representative in performance of duties spelled out under OWNER in Annex A2 of the ASHRAE Guideline for the Commissioning Process.

3.14 Energy Conservation

3.14.1 Design-Design the building, including the building envelope, HVAC systems, service water, heating, power, and lighting systems to achieve an energy consumption that is at least 30% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-2004. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award. Base the selection of solutions and technologies to achieve the above energy performance requirements on a life cycle cost analysis. Life cycle cost analyses shall follow the requirements set forth in NIST Handbook 135 Life-Cycle Costing Manual using an automated calculation tool such as BLCC. Cyclical and annual maintenance costs used shall come from ASHRAE recommendations or other similar industry standard sources.

3.14.2 Energy Star-the Contractor shall purchase Energy Star or FEMP-designated products. The term "Energy Star product" means a product that is rated for energy efficiency under an "Energy Star" program. The Term "FEMP-designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25% of equivalent products for energy efficiency. In the case of an electric motor of 1 to 500 horsepower the Contractor shall select only a premium efficient motor.

3.14.3 EPA 2005 Requirements:

3.14.3.1 Target Energy Consumption-The target energy consumption budget (excluding plug loads) for this facility, located in Climate Zone 6A is 58kBTU per sq. ft per year or less. The use of The Prescriptive Technology Solution Table, shown below, will result in an annual energy consumption less than or equal to the target energy budget figure.

CLIMATE ZONE 6A PRESCRIPTIVE TECHNOLOGY SOLUTION TABLE

ITEM:	COMPONENT:	MINIMUM REQUIREMENTS:
Roof	Attic	R-60
	Surface Reflectance	0.27
Walls	Light-weight Construction	R-30
Exposed Floors	Mass	R-30
Slabs	Unheated	NR(2)
Doors	Swinging	U-0.70
	Non-swinging	U-1.45
Infiltration		0.25 DFM/FT ² @75Pa(3)
Vertical Glazing	Window-to-wall	10%-20%
	Ratio (WWR)	
	Thermal Transmittance	U-0.42
	Solar Heat Gain Coefficient	0.46
	(SHGC)	
Interior Lighting	Lighting Power Density	0.9W/ft(2)
	(LPD	
	Ballast	Electronic Ballast
HVAC	Air Conditioner	4-pipe fan coil with central
		chiller and boiler plus
		DOAS(4) with 14.0 SEER DX
		coil (3.25 COP) with
		HHW coil on
		central boiler
	Gas Furnace	none
	ERV	70%-75% sensible effectiveness
Economizer		yes
Ventilation	Outdoor Air Damper	Motorized control
	Demand Control	NR
Ducts	Friction Rate	Decoupled (5)
	Sealing	Seal Class B
	Location	Interior only
	Insulation Level	R-6 (6)
Service Water Heating	Gas Storage	90% Et

NOTES:

- (1) Not Used
 (2) NR means there is no req. or recom. for a component in this climate.
 (3) Increased building tightness.

- (4) Dedicated Outdoor Air System. A dedicated DOAS providing:
- a.) Outside air for bld. indoor air quality and humidity control.
 - b.) Make-up air for kitchen and bathroom exhausts.
 - c.) Bld. Pressurization to prevent infiltration which allows for reduced heating/cooling moisture loads on the system.

Note: The DOAS does not provide sensible heating or cooling.

- (5) Decoupling exhaust and supply systems for laundry rooms. N/A

- (6) The duct and pipe insulation values are from "ASHRAE Advanced Energy Design Guide for Small Offices".

3.15 Fire Protection

3.15.1 Standards and Codes-All fire protection and life safety features shall be in accordance with UFC 3-600-01 and the criteria referenced therein. HGRs shall be classified as mission essential and shall be provided with sprinkler protection. The Army's first priority after life safety is to minimize collateral damage to aircraft which would affect full "mission-ready" status after a fire incident. As such, the aggressive application of Standards and Codes to minimize damage, down-time, clean-up, and return of aircraft to "fully mission-capable" readiness state is a high priority. Aircraft hangars shall use a fire suppression system that meets ALL the following requirements, in order of the priority shown. At no time will water systems be used as the primary suppression system without waiver approval:

- (1) Maximum protection of personnel (least risk to personnel within hangars during dispensing).
- (2) Maximum protection of airframes (least potential loss of airframes resulting from dispensing and clean-up).
- (3) Fastest return of airframes to operational/mission-ready state after discharge.
- (4) Minimal use of water (least use of water system [quantity and content] from dispensing through clean-up).
- (5) Least infrastructure/life cycle sustainment requirements.
- (6) Maximum protection of facility (least replacement impact).

3.15.2 Qualifications of a Fire Protection Engineer-The design of the fire protection features shall be by a qualified fire protection engineer (New York State certified PE per Chapter 6.13.11.1).

3.15.3 Fire Protection and Life Safety Analysis-A fire protection and life safety design analysis shall be provided for the building in the project. The analysis shall be submitted with the preliminary design submittal. The analysis shall include the classification of occupancy(ies) (both per IBC and NFPA 101); type of construction; height and area limitations (include calculations for allowable area increases); life safety provisions (exit travel distances, common path distances, dead end distances, exit unit width required and provided); building separation or exposure protection; specific compliance with NFPA codes and the IBC; requirements for fire-rated walls, doors, fire dampers, etc; analysis of automatic suppression systems and protected areas; water supplies; smoke control systems; fire alarm system, including connection to the base-wide system; fire detection system; standpipe systems; fire extinguishers; interior finish ratings; and other pertinent fire protection data. The submittal shall include a life safety floor plan, showing occupant loading, occupancy classifications and construction type, egress travel distances, exit capacities, areas with sprinkler protection, fire extinguisher locations, ratings of fire-resistive assemblies, and other data necessary to exhibit compliance with life safety code requirements.

3.15.4 Sprinkler System-The facility will be fully protected with automatic sprinkler systems. All floors and all the areas of the facilities shall be protected. In particular, the hangar bay area needs to be protected by either a high-expansion foam system or a closed-head Aqueous Film Forming Foam (AFFF) system per NFPA 409. Hangar bay fire suppression system shall have an objective goal of returning 85% of any damaged systems to duty within 24 hours after a fire event and a threshold goal of returning 90% of any damaged systems to duty within 72 hours after

the event. The sprinkler system design shall be in accordance with UFC 3-600-01 and NFPA 13. The sprinkler system hazard classifications shall be in accordance with UFC 3-600-01 and NFPA 13, and other applicable criteria. Design densities, design areas and exterior hose streams shall be in accordance with UFC 3-600-01. The sprinkler systems shall be designed and all piping sized with computer-generated hydraulic calculations. The exterior hose stream demand shall be included in the hydraulic calculations. A complete sprinkler system design, including sprinklers, branch lines, floor mains and risers, shall be shown on the drawings. The sprinkler system plans shall include node and pipe identification used in the hydraulic calculations. All sprinkler system drains, including main drains, test drains, and auxiliary drains, shall be routed to a 2' X 2' splash block at exterior grade.

3.15.4.1 Sprinkler Service Main and Riser-The sprinkler service main shall be a dedicated line from the distribution main. Sprinkler service and domestic service shall not be combined. The Contractor shall make the connection to the sprinkler service main provided by the site development Contractor. The Contractor shall make the required electrical connection to the tamper switch on the PIV provided by the site development Contractor. The Contractor shall route this conductor to and make the connection to the building fire alarm control panel (FACP). The ground floor entry penetration shall be sleeved per NFPA 13 requirements for seismic protection. The sprinkler entry riser shall include a double-check backflow preventer, a fire department connection, and a wall hydrant for testing of the backflow preventer. The sprinkler system shall include an indicating control valve for each sprinkler system riser, a flow switch reporting to the FACP, and an exterior alarm bell. All control valves shall be OS&Y gate-type and shall be provided with tamper switches connected to the FACP. Facilities with multiple floors shall be provided with floor control valves for each floor. The floor control valve assembly shall be in accordance with UFC 3-600-01, Figure 4-1.

3.15.4.2 Exterior Hose Stream-Exterior hose stream demand shall be in accordance with UFC 3-600-01. This shall be 250 gpm for light hazard and 500 gpm for ordinary hazard. Exterior hose stream demand shall be included in the sprinkler system hydraulic calculations.

3.15.4.3 Backflow Preventer-A double-check RPZ backflow preventer shall be provided on the fire water main and shall be located within the building. An exterior wall hydrant with dual hose connections with OS&Y valve shall be provided to allow testing of the backflow preventer at design flow as required by NFPA 13.

3.15.4.4 Fire Department Connection-A fire department connection shall be provided. These shall be located to be directly accessible to the fire department.

3.15.5 System Components and Hardware-Materials for the sprinkler system, fire pump system, and hose standpipe system shall be in accordance with NFPA 13 and NFPA 20.

3.15.6 Protection of Piping Against Earthquake Damage-Sprinkler and fire pump piping systems shall be protected against damage from earthquakes. Seismic protection shall include flexible and rigid couplings, away bracing, seismic separation assemblies where piping crosses building seismic separation joints, and other features as required by NFPA 13 for protection against damage from earthquakes.

3.15.7 Fire Water Supply-Fire flow test data is provided in the Appendix. The Contractor shall be responsible for coordinating with the geographic district in acquiring fire flow test data for preliminary fire protection system design. The Contractor shall verify the fire flow data by conduction necessary fire flow tests at the project site during project design and shall base the design of fire protection systems on the results of this test.

3.15.8 Fire Pump-The requirement for a fire pump installation shall be determined by the Contractor based on the fire flow test data from the project site and fire protection system design requirements for the project. If required, a complete fire pump installation shall be provided for the facility. It shall comply with the requirements of UFC 3-600-01, NFPA 13 and NFPA 20. The Contractor shall submit fire pump design analysis and drawings in the design requirements.

3.15.9 Fire Detection and Alarm-A fire alarm and detection system shall be provided for this facility. It shall comply with the requirements of UFC 3-600-01 and NFPA 72. The system shall be fully compatible with and integrated with the local base-wide central monitoring system.

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3.15.10 Building Construction-Construction shall comply with the requirements of UFC 3-600-01, the International Building Code-2006, and NFPA 101.

3.15.10.1 Fire Extinguishers-Portable fire extinguishers shall be provided where required by NFPA 101. Portable fire extinguishers shall be located and installed in accordance with NFPA 10, Portable Fire Extinguishers.

3.15.10.2 Interior Wall and Ceiling Finishes-Interior wall and ceiling finishes and movable partitions shall conform to the requirements of UFC 3-600-01 and NFPA 101.

3.15.11 Inspection and Testing-Inspect and test all fire suppression equipment and systems, fire pumps, and fire alarm and detection systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness the final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the Contract requirements. Two weeks prior to each final test, the Contractor shall notify, in writing, the Installation Fire Department and the Installation Public Works Representative of the test and invite them to witness the test.

3.15.12 Fire Extinguisher Cabinets-Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers.

3.15.13 Fire Alarm and Detection System-Sprinkler water flow alarms shall be zoned by building and floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler systems, etc. shall be zoned by type and by room location.

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4.0 APPLICABLE CRITERIA

Unless a specific document version or date is indicated, use criteria from the most current references, including any applicable addenda, unless otherwise stated in the contract or task order, as of the date of the Contractor's latest accepted proposal or date of issue of the contract or task order solicitation, whichever is later. In the event of conflict between References and/or Applicable Military Criteria, apply the most stringent requirement, unless otherwise specifically noted in the contract or task order.

4.1. INDUSTRY CRITERIA

Applicable design and construction criteria references are listed in Table 1 below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. See also Paragraph 3 for additional facility-specific applicable criteria.

Table 1: Industry Criteria

Air Conditioning and Refrigeration Institute (ARI)	
ARI 310/380	Packaged Terminal Air-Conditioners and Heat Pumps
ARI 440	Room Fan-Coil and Unit Ventilator
ANSI/ARI 430-99	Central Station Air Handling Units
ARI 445	Room Air-Induction Units
ARI 880	Air Terminals
Air Movement and Control Association (AMCA)	
AMCA 210	Laboratory Methods of Testing Fans for Rating
American Architectural Manufacturers Association (AAMA)	
AAMA 605	Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
AAMA 607.1	Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
AAMA 1503	Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Association of State Highway and Transportation Officials (AASHTO)	
	Roadside Design Guide [guardrails, roadside safety devices]

	Standard Specifications for Transportation Materials and Methods of Sampling and Testing [Road Construction Materials]
	Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals
	Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]
	A Policy of Geometric Design of Highways and Streets
American Bearing Manufacturers Association (AFBMA)	
AFBMA Std. 9	Load Ratings and Fatigue Life for Ball Bearings
AFBMA Std. 11	Load Ratings and Fatigue Life for Roller Bearings
American Boiler Manufacturers Association (ABMA)	
ABMA ISEI	Industry Standards and Engineering Information
American Concrete Institute	
ACI 302.2R	Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
ACI 318	Building Code Requirements for Structural Concrete
ACI SP-66	ACI Detailing Manual
ACI 530	Building Code Requirements for Masonry Structures
ADA Standards for Accessible Design	
See US Access Board	ADA and ABA Accessibility Guidelines for Buildings and Facilities, Chapters 3-10.
American Institute of Steel Construction (AISC)	
	Manual of Steel Construction – 13 th Edition (or latest version)
American Iron and Steel Institute	
AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members

American National Standards Institute 11 (ANSI)	
ANSI Z21.10.1	Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less
ANSI Z124.3	American National Standard for Plastic Lavatories
ANSI Z124.6	Plastic Sinks
ANSI Z21.45	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
ANSI/IEEE C2-2007	National Electrical Safety Code
ANSI/AF&PA NDS-2001	National Design Specification for Wood Construction
American Society of Civil Engineers (ASCE)	
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASCE 37	Design and Construction of Sanitary and Storm Sewers, Manuals and Reports on Engineering Practice [sanitary sewer and storm drain design criteria]
ASCE/SEI 31-03	Seismic Evaluation of Existing Buildings [Existing Building Alteration/Renovation]
ASCE/SEI 41-06	Seismic Rehabilitation of Existing Buildings [Existing Building Alteration/Renovation]
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)	
ASHRAE 90.1	ANSI/ASHRAE/IESNA 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Guideline 0	The Commissioning Process
ASHRAE Guideline 1.1	The HVAC Commissioning Process
ASHRAE Handbooks	Fundamentals, HVAC Applications, Systems and Equipment, Refrigeration (Applicable, except as otherwise specified)
ASHRAE Standard 15	Safety Standard for Refrigeration Systems
ASHRAE Standard 62.1	Ventilation for Acceptable Indoor Air Quality

ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy (Design portion is applicable, except where precluded by other project requirements.)
American Society of Mechanical Engineers International (ASME)	
ASME BPVC SEC VII	Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers
ASME A17.1	Safety Code for Elevators and Escalators
ASME B 31 (Series)	Piping Codes
American Water Works Association (AWWA)	
	Standards [standards for water line materials and construction]
American Welding Society	
	Welding Handbook
	Welding Codes and Specifications (as applicable to application, see International Building Code for example)
Architectural Woodwork Institute (AWI)	
Latest Version	AWI Quality Standards
Associated Air Balance Council (AABC)	
AABC MN-1	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems
	AABC Associated Air Balance Council Testing and Balance Procedures
ASTM International	
ASTM C1060-90(1997)	Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings
ASTM E 779 (2003)	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
ASTM E1827-96(2002)	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door

Builders Hardware Manufacturers Association (BHMA)	
ANSI/BHMA	The Various BHMA American National Standards
Building Industry Consulting Service International	
	Telecommunications Distribution Methods Manual (TDMM)
	Customer-Owned Outside Plant Design Manual (CO-OSP)
Code of Federal Regulations (CFR)	
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
10 CFR 430	Energy Conservation Program for Consumer Products
Consumer Electronics Association	
CEA 709.1B	Control Network Protocol Specification
CEA 709.3	Free-Topology Twisted-Pair Channel Specification
CEA 852	Tunneling Component Network Protocols Over Internet Protocol Channels
Electronic Industries Association (EIA)	
ANSI/EIA/TIA 568	Structured Cabling Series
ANSI/EIA/TIA 569	Commercial Building Standard for Telecommunications Pathways and Spaces (includes ADDENDA)
ANSI/TIA/EIA-606	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD EIA/TIA 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)	
	Manual on Uniform Traffic Control Devices for Streets and Highways [signage and pavement markings for streets and highways]
FHWA-NHI-01-021	Hydraulic Engineering Circular No. 22, Second Edition, URBAN DRAINAGE DESIGN MANUAL

Illuminating Engineering Society of North America (IESNA)	
IESNA RP-1	Office Lighting
IESNA RP-8	Roadway Lighting
IESNA Lighting Handbook	Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE)	
	Standard for Use of the International System of Units (SI): the Modern Metric System
Standard 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
International Code Council (ICC)	
IBC	<p>International Building Code</p> <p>Note: All references in the International Building Code to the International Electrical Code shall be considered to be references to NFPA 70.</p> <p>All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58.</p> <p>All references in the International Building Code to the International Fire Code and Chapter 9 shall be considered to be references to Unified Facilities Criteria (UFC) 3-600-01.</p>
IMC	<p>International Mechanical Code –</p> <p>Note: For all references to “HEATING AND COOLING LOAD CALCULATIONS”, follow ASHRAE 90.1</p> <p>Note: For all references to “VENTILATION”, follow ASHRAE 62.1</p>
IRC	International Residential Code
IPC	International Plumbing Code
IEC	Energy Conservation Code (IEC) –Applicable only to the extent specifically referenced herein. Refer to Paragraph 5, ENERGY CONSERVATION requirements.
IGC	International Gas Code - not applicable. Follow NFPA 54, National Fuel Gas Code and NFPA 58, Liquefied Petroleum Gas Code.

International Organization for Standardization (ISO)	
ISO 6781:1983	Qualitative detection of thermal irregularities in building envelopes – infrared method
LonMark International (LonMark)	
LonMark Interoperability Guidelines	(available at www.lonmark.org), including: Application Layer Guidelines, Layer 1-6 Guidelines, and External Interface File (XIF) Reference Guide
LonMark Resource Files	(available at www.lonmark.org), including Standard Network Variable Type (SNVT) definitions
Metal Building Manufacturers Association (MBMA)	
	Metal Building Systems Manual
Midwest Insulation Contractors Association (MICA)	
	National Commercial and Industrial Insulation Standards Manual
National Association of Corrosion Engineers International (NACE)	
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0185	Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe
NACE RP0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines
National Electrical Manufacturers Association (NEMA)	
National Environmental Balancing Bureau (NEBB)	
	Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems
National Fire Protection Association (NFPA)	
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 13	Installation of Sprinkler Systems

NFPA 13R	Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems
NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 20	Installation of Centrifugal Fire Pumps
NFPA 24 NFPA 25	Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design] Inspection, Testing And Maintenance Of Water-Based Fire Protection Systems
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 31	Installation of Oil Burning Equipment
NFPA 54	National Fuel Gas Code
NFPA 58	Liquefied Petroleum Gas Code
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 76	Fire Protection of Telecommunications Facilities
NFPA 80	Standard for Fire Doors and Fire Windows
NFPA 90a	Installation of Air Conditioning and Ventilating Systems
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	Life Safety Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
National Roofing Contractor's Association (NRCA)	
	Roofing and Waterproofing Manual
National Sanitation Foundation, International	

NSF/ANSI Std. 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 36, 37, 51, 52, 59, 169	Food Equipment Standards
ANSI/UL Std. 73, 197, 471, 621, 763	Food Equipment Standards
CSA Std. C22.2 No. 109, 120, 195	Food Equipment Standards
Occupational Safety and Health Administration (OSHA)	
Title 29, Part 1926	OSHA Construction Industry Standards, Title 29, Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction
Plumbing and Drainage Institute (PDI)	
PDI G 101	Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
PDI WH201	Water Hammer Arrestors
Precast Concrete Institute	
PCI Design Handbook	Precast and Prestressed Concrete
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)	
SMACNA HVAC Duct Construction Standards	HVAC Duct Construction Standards - Metal and Flexible
SMACNA Architectural Manual	Architectural Sheet Metal Manual
SMACNA HVAC TAB	HVAC Systems - Testing, Adjusting and Balancing
State/Local Regulations	
	State Department of Transportation Standard Specifications for Highway and Bridge Construction
	Sedimentation and Erosion Control Design Requirements
	Environmental Control Requirements
	Storm Water Management Requirements

Steel Door Institute (SDI)	
ANSI A250.8/SDI 100	Standard Steel Doors and Frames
Steel Deck Institute	
	SDI Diaphragm Design Manual
Steel Joist Institute	
	Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders
Underwriters Laboratories (UL)	
UL 96A	Installation Requirements for Lightning Protection Systems
UL 300	Standard for Safety for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas
UNITED STATES ACCESS BOARD: U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD	
ADA and ABA Accessibility Guidelines for Buildings and Facilities	<p>ABA Accessibility Standard for DoD Facilities</p> <p>Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10.</p> <p>Use this reference in lieu of IBC Chapter 11.</p> <p>Excluded are:</p> <p>(a) Facilities, or portions of facilities, on a military installation that are designed and constructed for use exclusively by able-bodied military personnel (See Paragraph 3 for any reference to this exclusion).</p> <p>(b) Reserve and National Guard facilities, or portions of such facilities, owned by or under the control of the Department of Defense, that are designed and constructed for use exclusively by able-bodied military personnel. (See paragraph 3 for any reference to this exclusion).</p>
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	
	FDA National Food Code
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED-NC	Green Building Rating System for New Construction & Major Renovations
	Application Guide for Multiple Buildings and On-Campus Building

	Projects
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4.2. MILITARY CRITERIA

The project shall conform to the following criteria. Certain design impacts and features due to these criteria are noted for the benefit of the offeror. However, all requirements of the referenced criteria will be applicable, whether noted or not, unless otherwise specified herein.

4.2.1. Energy Policy Act of 2005 (Public Law 109-58) (applies only to the extent specifically implemented in the contract, which may or may not directly cite or reference EPACT)

4.2.2. Executive Order 12770: Metric Usage In Federal Government

(a) Metric design and construction is required except when it increases construction cost. Offeror to determine most cost efficient system of measurement to be used for the project.

4.2.3. TB MED 530: Occupational and Environmental Health Food Sanitation

4.2.4. Unified Facilities Criteria (UFC) 3-410-01FA: Heating, Ventilating, and Air Conditioning - applicable only to the extent specified in paragraph 5, herein.

4.2.5. Deleted.

4.2.6. UFC 3-600-01 Design: Fire Protection Engineering for Facilities. Use the latest edition of the IBC in coordination with this UFC. Use Chapters 3, 6, 7, 33 and UFC 3-600-01. If any conflict occurs between these Chapters and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence. Use UFC 3-600-01 in lieu of IBC Chapters 4, 8,9,10.

4.2.7. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings

4.2.8. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse (Use most recent version, regardless of references thereto in other publications)

(a) Note the option to use tie force method or alternate path design for Occupancy Category II.

4.2.9. UFC 4-021-01 Design and O&M: Mass Notification Systems

4.2.10. Technical Criteria for Installation Information Infrastructure Architecture (I3A)

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4.2.11. U.S. Army Information Systems Engineering Command (USAISEC) TG for the Integration of SECRET Internet Protocol (IP) Router Network (SIPRNET). See Paragraph 3 for applicability to specific facility type. May not apply to every facility. This is mandatory criteria for those facilities with SIPRNET.

4.2.11.1. Draft Guide Specification for Section 27 05 28 PROTECTIVE DISTRIBUTION SYSTEM (PDS) FOR SIPRNET COMMUNICATIONS SYSTEMS, found at http://rfpwizard.cecer.army.mil/HTML/docs/Refs/SECTION_270528-v3.pdf

5.0 GENERAL TECHNICAL REQUIREMENTS

This paragraph contains technical requirements with general applicability to Army facilities. See also Paragraph 3 for facility type-specific operational, functional and technical requirements. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed.

5.1. SITE PLANNING AND DESIGN

5.1.1. STANDARDS AND CODES: The site planning and design shall conform to APPLICABLE CRITERIA and to paragraph 6, PROJECT SPECIFIC REQUIREMENTS.

5.1.2. SITE PLANNING OBJECTIVES: Group buildings in configurations that create a sense of community and promote pedestrian use. See paragraph 3 for additional site planning requirements relating to building functions.

5.1.2.1. Provide enclosures and or visual screening devices for Outdoor Utility such as dumpsters, emergency generators, transformers, heating, ventilation, and air conditioning units from streetscape and courtyard views to limit visual impact. Enclosures shall be compatible with the building they serve and accessible by vehicle. The location of dumpsters can have a significant visual impact and should be addressed as part of an overall building design and incorporated in site planning.

5.1.2.2. Where included in the project, dumpster pads shall be concrete (minimum of 8 inches thick on 4 inch base course, unless site conditions dictate more conservative requirements) and directly accessible by way of a paved service drive or parking lot with adequate overhead clearance for collection vehicles. Provide space at dumpster areas for recycling receptacles. Coordinate with Installation on recycling receptacle types, sizes and access requirements and provide space at dumpster areas to accommodate them.

5.1.2.3. Vehicular Circulation. Apply design vehicle templates provided by the American Association of State Highway and Transportation Officials (AASHTO) to the site design. The passenger car class includes passenger cars and light trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational – privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Provide vehicle clearances required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Provide required traffic control signage Site entrances and site drive aisles shall maximize spacing between drives, incorporate right-angle turns, and limit points of conflict between traffic. Design Services Drives to restrict access to unauthorized vehicles by removable bollards, gates, or other barriers to meet Anti-Terrorism/Force Protection (ATFP) requirements. Orient service drives to building entrances other than the primary pedestrian entry at the front of the building.

5.1.2.4. Provide Emergency Vehicle Access around the facility and shall be in accordance with AT/FP requirements. Maintain a 33-foot clear zone buffer for emergency vehicles, designed to prevent other vehicles from entering the AT/FP standoff to the building.

5.1.2.5. Clear and grub all trees and vegetation necessary for construction; but, save as many trees as possible. Protect trees to be saved during the construction process from equipment.

5.1.2.6. Stormwater Management. Employ design and construction strategies (Best Management Practices) that reduce stormwater runoff, reduce discharges of polluted water offsite and maintain or restore predevelopment hydrology with respect to temperature, rate, volume and duration of flow to the maximum extent practicable. See paragraph 6, PROJECT SPECIFIC requirements for additional information.

5.1.3. EXTERIOR SIGNAGE: Provide exterior signage in accordance with Appendix H, Exterior Signage. Provide exterior NO SMOKING signage that conveys building and grounds smoking policy.

5.1.4. EXISTING UTILITIES: Base utilities maps and capacities for this site are included as part of this RFP. See paragraph 6 for more detailed information.

5.2. SITE ENGINEERING

5.2.1. STANDARDS AND CODES: The site engineering shall conform to APPLICABLE CRITERIA.

5.2.2. SOILS:

5.2.2.1. A report has been prepared to characterize the subsurface conditions at the project site and is **appended to these specifications**. The report provides a general overview of the soil and geologic conditions with detailed descriptions at discrete boring locations. The Contractor's team shall include a licensed geotechnical engineer to interpret the report and develop earthwork and foundation recommendations and design parameters in which to base the contractor's design. If any additional subsurface investigation or laboratory analysis is required to better characterize the site or develop the final design, the Contractor shall perform it under the direction of a licensed geotechnical engineer. There will be no separate payment for the cost of additional tests. If differences between the Contractor's additional subsurface investigation and the government provided soils report or the reasonably expected conditions require material revisions in the design, an equitable adjustment may be made, in accordance with the provisions of the Differing Site Conditions clause. The basis for the adjustment would be the design and construction appropriate for the conditions described in the Government furnished report or the reasonably expected conditions, in comparison with any changes required by material differences in the actual conditions encountered, in accordance with the terms of contract clause Differing Site Conditions.

5.2.2.2. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal, as described in Section 01 33 16, *Design After Award*.

5.2.3. VEHICLE PAVEMENTS: (as applicable to the project)

5.2.3.1. Design procedures and materials shall conform to one of the following: 1) the USACE Pavement Transportation Computer Assisted Structural Engineering (PCASE) program, 2) American Association of State Highway and Transportation Officials (AASHTO) or, 3) the applicable state Department of Transportation standards in which the project is located. See paragraph 5.2.2.2 and Section 01 33 16 for required information for the Contractor's geotechnical evaluation report. The minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base or as required by the pavement design, whichever is greater, unless specifically identified by the Government to be a gravel road. Design roads and parking areas for a life expectancy of 25 years with normal maintenance. Parking area for tactical vehicles (as applicable to the project) shall be Portland Cement Concrete (PCC) rigid pavement design. For concrete pavements, submit joint layout plan for review and concurrence. Design pavements for military tracked vehicles (as applicable to the project) IAW USACE PCASE. Traffic estimates for each roadway area will be as shown on the drawings or listed in Section 01 10 00 Paragraph 6.4.4. Pavement markings and traffic signage shall comply with the Installation requirements and with the Manual on Uniform Traffic Control Devices.

5.2.3.2. Parking Requirements.

(a) All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces.

(b) Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.

5.2.3.3. Sidewalks. Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable and/or paragraph 6 and/or site plans, where applicable..

5.2.4. CATHODIC PROTECTION: Provide cathodic protection systems for all underground metallic systems and metallic fittings/portions of non-metallic, underground systems, both inside and outside the building 5 foot line that are subject to corrosion. Coordinate final solutions with the installation to insure an approach that is consistent with installation cathodic protection programs.

5.2.5. UTILITIES: See paragraph 6.4.6 for specific information on ownership of utilities and utility requirements. Meter all utilities (gas, water, and electric, as applicable) to each facility. For Government owned utilities, install meters that are wireless data transmission capable as well as have a continuous manual reading option. All meters will be capable of at least hourly data logging and transmission and provide consumption data for gas, water, and

electricity. Gas and electric meters will also provide demand readings based on consumption over a maximum of any 15 minute period. Configure all meters to transmit at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation.

5.2.6. PERMITS: The CONTRACTOR shall be responsible for obtaining all permits (local, state and federal) required for design and construction of all site features and utilities.

5.2.7. IRRIGATION. Landscape irrigation systems, if provided, shall comply with the following:

5.2.7.1. Irrigation Potable Water Use Reduction. Reduce irrigation potable water use by 100 percent using LEED credit WE1.1 baseline (no potable water used for irrigation), except where precluded by other project requirements.

5.2.8. EPA WATERSENSE PRODUCTS AND CONTRACTORS. Except where precluded by other project requirements, use EPA WaterSense labeled products and irrigation contractors that are certified through a WaterSense labeled program where available.

5.3. ARCHITECTURE AND INTERIOR DESIGN:

This element will be evaluated per APPLICABLE CRITERIA under the quality focus.

5.3.1. STANDARDS AND CODES: The architecture and interior design shall conform to APPLICABLE CRITERIA.

5.3.2. GENERAL: Overall architectural goal is to provide a functional, quality, visually appealing facility that is a source of pride for the installation and delivered within the available budget and schedule.

5.3.3. COMPUTATION OF AREAS: See APPENDIX Q for how to compute gross and net areas of the facility(ies).

5.3.4. BUILDING EXTERIOR: Design buildings to enhance or compliment the visual environment of the Installation. Where appropriate, reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Exterior colors shall conform to the Installation requirements. See paragraph 6.

5.3.4.1. Building Numbers: Permanently attach exterior signage on two faces of each building indicating the assigned building number or address. Building number signage details and locations shall conform to Appendix H, Exterior Signage.

5.3.5. BUILDING INTERIOR

5.3.5.1. Space Configuration: Arrange spaces in an efficient and functional manner in accordance with area adjacency matrices.

5.3.5.2. Surfaces: Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.

5.3.5.3. Color: The color, texture and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordinate the building colors and finishes for a cohesive design. Select colors appropriate for the building type. Use color, texture and pattern to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Select finishes with regards to aesthetics, maintenance, durability, life safety and image. Limit the number of similar colors for each material. Use medium range colors for ceramic and porcelain tile grout to help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked or speckled. Coordinate finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms / warning lights, emergency lighting, and other miscellaneous items with the building interior. Match color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) the ceiling color.

5.3.5.4. Circulation: Circulation schemes must support easy way finding within the building.

5.3.5.5. Signage: Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plan shall be from one manufacturer. Include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identification Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards (8) NO SMOKING signage that conveys building smoking policy. Use of emblems or logos may also be incorporated into the signage plan.

5.3.5.6. Window Treatment: Provide interior window treatments with adjustable control in all exterior window locations for control of day light coming in windows or privacy at night. Maintain uniformity of treatment color and material to the maximum extent possible within a building.

5.3.5.7. Casework: Unless, otherwise specified, all casework for Cabinetry and cases shall be "custom grade", as described in the AWI Quality Standards.

5.3.6. COMPREHENSIVE INTERIOR DESIGN

5.3.6.1. Comprehensive Interior Design includes the integration of a Structural Interior Design (SID) and a Furniture, Fixtures and Equipment (FF&E) design and package. SID requires the design, selection and coordination of interior finish materials that are integral to or attached to the building structure. Completion of a SID involves the selection and specification of applied finishes for the building's interior features including, but not limited to, walls, floors, ceilings, trims, doors, windows, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package includes finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build out. The SID also provides basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. See Section 01 33 16 for SID design procedures.

5.3.6.2. The FF&E design and package includes the design, selection, color coordination and of the required furnishing items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility coordinated with the interior finish materials in the SID. The FF&E package includes the specification, procurement documentation, placement plans, ordering and finish information on all freestanding furnishings and accessories, and a cost estimate. Coordinate the selection of furniture style, function and configuration with the defined requirements. Examples of FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens. Criteria for furniture selection include function and ergonomics, maintenance, durability, sustainability, comfort and cost. See Section 01 33 16 for FFE design procedures.

5.4. STRUCTURAL DESIGN

5.4.1. STANDARDS AND CODES: The structural design shall conform to APPLICABLE CRITERIA.

5.4.2. GENERAL: The structural system must be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Do not locate columns, for instance, in rooms requiring visibility, circulation or open space, including, but not limited to entries, hallways, common areas, classrooms, etc. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. Analyze, design and detail each building as a complete structural system. Design structural elements to preclude damage to finishes, partitions and other frangible, non-structural elements to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable of the applicable material standard, e.g., ACI, AISC, Brick Industry Association, etc. When modular units or other pre-fabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.

5.4.3. LOADS: See paragraph 3 for facility specific (if applicable) and paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C for wind. If not specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section "Design After Award". Design the ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, systems and equipment bracing, ducting, piping, etc. for gravity, seismic, lateral loads and for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

- (a) Supporting members of glazed elements, e.g. window jamb, sill, header
- (b) Connections of glazed element to supporting members, e.g. window to header
- (c) Connections of supporting members to each other, e.g. header to jamb
- (d) Connections of supporting members to structural system, e.g. jamb to foundation.

5.4.4. TERMITE TREATMENT: (Except Alaska) Provide termite prevention treatment in accordance with Installation and local building code requirements, using licensed chemicals and licensed applicator firm.

5.5. THERMAL PERFORMANCE

5.5.1. STANDARDS AND CODES: Building construction and thermal insulation for mechanical systems shall conform to APPLICABLE CRITERIA.

5.5.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT. Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. Pending the publication of the 2010 version of ASHRAE 90.1, the use of painted interior walls is not an acceptable air barrier method.

5.5.2.1. Trace a continuous plane of air-tightness throughout the building envelope and make flexible and seal all moving joints.

5.5.2.2. The air barrier material(s) must have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178

5.5.2.3. Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.

5.5.2.4. Support the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage, and transfer the load to the structure.

5.5.2.5. Seal all penetrations of the air barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly.

5.5.2.6. The air barrier must be durable to last the anticipated service life of the assembly.

5.5.2.7. Do not install lighting fixtures with ventilation holes through the air barrier

5.5.2.8. Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers such as at elevator shafts.

5.5.2.9. Damper and control to close all ventilation or make-up air intakes and exhausts, atrium smoke exhausts and intakes, etc when leakage can occur during inactive periods.

5.5.2.10. Compartmentalize garages under buildings by providing air-tight vestibules at building access points.

5.5.2.11. Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.

5.5.2.12. Performance Criteria and Substantiation: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:

(a) Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed 0.25cfm/ft² at a pressure differential of 0.3" w.g.(75 Pa) in accordance with ASTM's E 779 (2003) or E-1827-96 (2002). Accomplish tests using either pressurization or depressurization or both. Divide the volume of air leakage in cfm @ 0.3" w.g. (L/s @ 75 Pa) by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in cfm/ft² @ 0.3" w.g. (L/s.m² @ 75 Pa). Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.

(b) Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in (a) above.

(c) Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.

5.6. PLUMBING

5.6.1. STANDARDS AND CODES: The plumbing system shall conform to APPLICABLE CRITERIA.

5.6.2. PRECAUTIONS FOR EXPANSIVE SOILS: Where expansive soils are present, include design features for underslab piping systems and underground piping serving chillers, cooling towers, etc, to control forces resulting from soil heave. Some possible solutions include, but are not necessarily limited to, features such as flexible expansion joints, slip joints, horizontal offsets with ball joints, or multiple bell and spigot gasketed fittings. For structurally supported slabs, suspend piping from the structure with adequate space provided below the pipe for the anticipated soil movement.

5.6.3. HOT WATER SYSTEMS: For Hot Water heating and supply, provide a minimum temp of 140 Deg F in the storage tank and a maximum of 110 Deg F at the fixture, unless specific appliances or equipment specifically require higher temperature water supply.

5.6.4. SIZING HOT WATER SYSTEMS: Unless otherwise specified or directed in paragraph 3, design in accordance with ASHRAE Handbook Series (appropriate Chapters), ASHRAE Standard 90.1, and the energy conservation requirements of the contract. Size and place equipment so that it is easily accessible and removable for repair or replacement.

5.6.5. JANITOR CLOSETS: In janitor spaces/room/closets, provide at minimum, a service sink with heavy duty shelf and wall hung mop and broom rack(s).

5.6.6. FLOOR DRAINS: As a minimum, provide floor drains in mechanical rooms and areas, janitor spaces/rooms/closets and any other area that requires drainage from fixtures or equipment, drain downs, condensate, as necessary.

5.6.7. URINALS: Urinals shall be vitreous china, wall-mounted, wall outlet, non-water using, with integral drain line connection, and with sealed replaceable cartridge or integral liquid seal trap. Either type shall use a biodegradable liquid to provide the seal and maintain a sanitary and odor-free environment. Install, test and maintain in accordance with manufacturer's recommendations. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4 inch per foot. Do not use copper tube or pipe for drain lines that connect to the urinal. Manufacturer shall provide an operating manual and on-site training to installation operations personnel for the

proper care and maintenance of the urinal. For complexes, non-water using urinals are not required for barracks type spaces.

5.6.8. BUILDING WATER USE REDUCTION. Reduce building potable water use in each building 30 percent using IPC fixture performance requirements baseline.

5.6.9. Do not use engineered vent or Sovent® type drainage systems.

5.6.10. Where the seasonal design temperature of the cold water entering a building is below the seasonal design dew point of the indoor ambient air, and where condensate drip will cause damage or create a hazard, insulate plumbing piping with a vapor barrier type of insulation to prevent condensation. Do not locate water or drainage piping over electrical wiring or equipment unless adequate protection against water (including condensation) damage is provided. Insulation alone is not adequate protection against condensation. Follow ASHRAE Fundamentals Chapter 23, Insulation for Mechanical Systems, IMC paragraph 1107 and International Energy Conservation Code for pipe insulation requirements.

5.6.11. Cover all drain, waste and vent piping to prevent mortar or other debris from being flushed down and blocking pipes during such construction activities.

5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

5.7.1. STANDARDS AND CODES: The electrical systems for all facilities shall conform to APPLICABLE CRITERIA.

5.7.2. MATERIALS AND EQUIPMENT: Materials, equipment and devices shall, as a minimum, meet the requirements of Underwriters Laboratories (UL) where UL standards are established for those items. Wiring for branch circuits shall be copper. Motors larger than one-half horsepower shall be three phase. All electrical systems shall be pre-wired and fully operational unless otherwise indicated. Wall mounted electrical devices (power receptacles, communication outlets and CATV outlets) shall have matching colors, mounting heights and faceplates.

5.7.3. POWER SERVICE: Primary service from the base electrical distribution system to the pad-mounted transformer and secondary service from the transformer to the building service electrical equipment room shall be underground. See paragraph 6 for additional site electrical requirements.

5.7.3.1. Spare Capacity: Provide 10% space for future circuit breakers in all panelboards serving residential areas of buildings and 15% spaces in all other panelboards.

5.7.4. TELECOMMUNICATION SERVICE: Connect the project's facilities to the Installation telecommunications (voice and data) system through the outside plant (OSP) telecommunications underground infrastructure cabling system per the I3A Criteria. Connect to the OSP cabling system from each facility main cross connect located in the telecommunications room.

5.7.5. LIGHTING: Comply with the recommendations of the Illumination Engineering Society of North America (IESNA), the National Energy Policy Act and Energy Star requirements for lighting products..

5.7.5.1. Interior Lighting:

(a) Reflective Surfaces: Coordinate interior architectural space surfaces and colors with the lighting systems to provide the most energy-efficient workable combinations.

(b) High Efficiency Fluorescent Lighting: Utilize NEMA premium electronic ballasts and energy efficient fluorescent lamps with a Correlated Color Temperature (CCT) of 4100K. Linear fluorescent and compact fluorescent fixtures shall have a Color Rendering Index of (CRI) of 87 or higher. Fluorescent lamps shall be the low mercury type qualifying as non-hazardous waste upon disposal. Do not use surface mounted fixtures on acoustical tile ceilings. Provide an un-switched fixture with emergency ballast shall be provided at each entrance to the building.

(c) Solid State Lighting: Fixtures shall provide lighting with a minimum Correlated Color Temperature (CCT) of 4100K and shall have a Color Rendering Index of (CRI) of 75 or higher. Verify performance of the light producing solid state components by a test report in compliance with the requirements of IESNA LM 80. Verify performance

of the solid state light fixtures by a test report in compliance with the requirements of IESNA LM 79. Provide lab results by a NVLAP certified laboratory. The light producing solid state components and drivers shall have a life expectancy of 50,000 operating hours while maintaining at least 70% of original illumination level. Provide a complete five year warranty for fixtures.

(d) Metal Halide Lighting (where applicable): Metal Halide lamp fixtures in the range of 150-500 Watts shall be pulse start type and have a minimum efficiency rating of 88%.

(e) Lighting Controls: ANSI/ASHRAE/IESNA 90.1 has specific lighting controls requirements. Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (classrooms, conference rooms) to promote the productivity, comfort and well being of the building occupants. In office spaces, the preferred lighting should be a 30 FC ambient lighting level with occupancy sensor controlled task lighting in the work spaces to provide a composite lighting level of 50 FC on the working surfaces. Consider incorporating daylighting techniques for the benefit of reducing lighting energy requirements while improving the quality of the indoor spaces. If daylight strategies are used, additional coordination is required with the architect and mechanical engineer. Additionally, incorporate electric lighting controls to take advantage of the potential energy savings.

(f) Exterior Lighting: See paragraph 6.9 for site specific information, if any, on exterior lighting systems. Minimize light pollution and light trespass by not over lighting and use cut-off type exterior luminaries.

5.7.6. TELECOMMUNICATION SYSTEM: Building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA, including but not limited to I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling.. Items included under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.

5.7.6.1. Design, install, label and test all telecommunications systems in accordance with the I3A Criteria and ANSI/TIA/EIA 568, 569, and 606 standards. A Building Industry Consulting Services International (BICSI) Registered Communications Distribution Designer (RCDD) with at least 2 yrs related experience shall develop and stamp telecommunications design, and prepare the test plan. See paragraph 5.8.2.5 for design of environmental systems for Telecommunications Rooms.

5.7.6.2. The installers assigned to the installation of the telecommunications system or any of its components shall be regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. Key personnel; i.e., supervisors and lead installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel. In lieu of BICSI certification, supervisors and installers shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products.

5.7.6.3. Perform a comprehensive end to end test of all circuits to include all copper and fiber optic cables upon completion of the BCS and prior to acceptance of the facility. Provide adequate advanced notification to the COR to allow COR and Installation personnel attendance The BCS circuits include but are not limited to all copper and fiber optic(FO) entrance cables, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, and workstation outlets. Test in accordance with ANSI/EIA/TIA 568 standards. Use test instrumentation that meets or exceeds the standard. Submit the official test report to include test procedures, parameters tested, values, discrepancies and corrective actions in electronic format. Test and accomplish all necessary corrective actions to ensure that the government receives a fully operational, standards based, code compliant telecommunications system.

5.7.7. LIGHTNING PROTECTION SYSTEM: Provide a lightning protection system where recommended by the Lightning Risk Assessment of NFPA 780, Annex L.

5.8. HEATING, VENTILATING, AND AIR CONDITIONING

5.8.1. STANDARDS AND CODES: The HVAC system shall conform to APPLICABLE CRITERIA.

5.8.2. DESIGN CONDITIONS.

5.8.2.1. Outdoor and indoor design conditions shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1. All Buildings with minimum LEED Silver requirement (or better) will earn LEED Credit EQ 7.1, Thermal Comfort-Design., except where precluded by other project requirements. Where the contract specifies indoor design temperature, airflow, humidity conditions, etc., use those parameters.

5.8.2.2. High Humidity Areas: Design HVAC systems in geographical areas meeting the definition for high humidity in UFC 3-410-01FA to comply with the special criteria therein for humid areas.

5.8.2.3. Cooling equipment may be oversized by up to 15 percent to account for recovery from night setback. Heating equipment may be oversized by up to 30 percent to account for recovery from night setback. Design single zone systems and multi-zone systems to maintain an indoor design condition of 50% relative humidity for cooling only. For heating only where the indoor relative humidity is expected to fall below 20% for extended periods, add humidification to increase the indoor relative humidity to 30%. Provide ventilation air from a separate dedicated air handling unit (DOAU) for facilities using multiple single zone fan-coil type HVAC systems. Do not condition outside air through fan coil units. Avoid the use of direct expansion cooling coils in air handling units with constant running fans that handle outside air.

5.8.2.4. Locate all equipment so that service, adjustment and replacement of controls or internal components are readily accessible for easy maintenance.

5.8.2.5. Environmental Requirements for Telecommunications Rooms,(including SIPRNET ROOMS, where applicable for specific facility type). Comply with ANSI/EIA/TIA 569 and the I3A.

5.8.2.6. Fire dampers: dynamic type with a dynamic rating suitable for the maximum air velocity and pressure differential to which the damper is subjected. Test each fire damper with the air handling and distribution system running.

5.8.3. BUILDING AUTOMATION SYSTEM. The Building Automation System (BAS) shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) and other building systems. The BAS shall be based on an Open implementation of BACnet using ASHRAE 135-2004 exclusively as the communications protocol for communication between DDC Hardware devices to allow multi-vendor interoperability. The building BAS shall include integration to a basewide supervisory monitoring and control (M&C) system.

5.8.3.1. The system shall be Open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original hardware vendor or their agents. This includes, but is not limited to the following:

- Hardware shall be installed such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.
- Necessary documentation (including rights to documentation and data), configuration information, configuration tools, application programs (with comments explaining program logic), application source code for programmable controllers, drivers, and other software shall be licensed to and remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.8.3.2. All DDC Hardware shall:

- Be connected to a ASHRAE 135 MS/TP control network.
- Implement all required functionality of the application network interface via BACnet objects, properties, and services
- Shall conform to basewide addressing schemes, particularly with regard to Device ID.
- Minimize the use of proprietary BACnet objects and properties
- Not use any of the following BACnet services for application control functionality or communication:
 - AtomicFile or AtomicFileWrite
 - ConfirmedTextMessage or UnconfirmedTextMessage
 - ConfirmedPrivateTransfer or UnconfirmedPrivateTransfer

- Communicate over the control network via ASHRAE 135 exclusively.
- Conform to the BACnet Testing Lab's Device Implementation Guidelines.
- Be capable of responding to Who-Is/I-Am and Who-Has/I-Have service requests.
- All settings and parameters used by the application shall be fully configurable:
 - to the greatest extent possible, via properties of BACnet objects that can be written to via BACnet services.
 - via properties of BACnet objects that can be written to via BACnet services for the following
- Setpoint
- Alarm limit
- Schedule modification
- Trend modification
 - All other settings and parameters that can not be written to via BACnet services shall be fully configurable via either:
- Properties of BACnet objects that can be written to with a configuration tool, or
- Hardware settings on the controller itself to support the application.
- Provide BACnet objects, properties, and services required to support the application and supervisory monitoring and control functionality including:
 - System start/stop and overrides.
 - Scheduling
 - Alarming
 - Trending
- To the greatest extent practical, not rely on the control network to perform the application
- Be BTL Listed

5.8.3.3. Include any device capable of communicating over IEEE 802.3 (Ethernet) in a DIACAP and Certificate of Networkiness (CoN) for this installation, regardless of whether the Ethernet connection is active at time of installation. Do not use devices with Ethernet connection capability not included in a DIACAP or without a DIACAP or without a CoN shall not be used.

5.8.3.4. Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling one and only one package unit.

5.8.3.5. Not Used

5.8.3.6. Perform all necessary actions needed to fully integrate the ASHRAE 135-based building control system to the UMCS. These actions include but are not limited to:

- Install BACnet MS/TP-to-IP routers and/or BACnet/IP Broadcast Management Devices (BBMD) in accordance with ASHRAE 135 Annex J as needed to connect the building control network to the UMCS IP network. Devices shall be capable of configuration via DHCP and Write-Broadcast-Distribution-Table messages but shall not rely on these services for configuration. All communication between the UMCS and building networks shall be via BACnet/IP and in accordance with ASHRAE 135. Any IP network work including access to existing networks shall be coordinated with the installation Network Enterprise Center (NEC).
- Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.
- Configure M&C software to provide hierarchically arranged screens to allow operator to configure (via BACnet services to the appropriate objects) all devices on the installation BACnet internetwork. The following adjustments shall be supported:
 - Setpoints
 - Alarm limits
 - Schedules
 - Trends

This requirement is separate from and in addition to the requirement to provide all necessary programming and configuration software.

5.8.3.7. Perform all necessary actions needed to integrate legacy systems to the UMCS. Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting. Integration may be via drivers in the M&C Software or hardware gateways may be provided. Where hardware gateways are provided, include all hardware, software, software licenses, and configuration tools required for gateway operation, modification, and maintenance. Configure software driver or a hardware gateway to support M&C software functionality as listed above.

5.8.3.8. Provide the following to the Government for review prior to acceptance of the system:

- The latest version of all software including source code for application software (for programmable controllers), software licenses, and user manuals required to program, configure and operate the system.
- Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum for each device:
 - Device ID and network address (MS/TP network and MAC address, or IP address).
 - Input and Output Objects including Name, Type, Description, and relevant supported or required Properties.
 - Hardware I/O, including Type (AI, AO, BI, BO) and Description.
 - Alarm information including alarm limits and BACnet device IDs, object IDs, and property information.
 - Supervisory control information including BACnet device IDs, object IDs, and properties for trending and overrides.
 - Objects and Properties needed for device configuration.
 - Device IDs and objects (where applicable) of remote devices and objects that communicate with the given Device (e.g. clients and servers for BACnet services used by the given device).
 - Example Points Schedules are available at: <https://eko.usace.army.mil/fa/besc/>
- Riser diagram of the network showing all network cabling and hardware. Label hardware with BACnet Device IDs, BACnet network addresses, network names, and locations.
- A consolidated list of all Device IDs.
- Control System Schematic diagram and Sequence of Operation for each controlled system.
- Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.
- Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative

Table 5-1: QC Checklist

5.8.3.9. Perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. During the PVT, demonstrate that the system performs as specified, including but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

5.8.3.10. Provide a 1 year unconditional warranty on the installed system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.

5.8.3.11. Provide training at the project site on the installed building system. Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

5.8.4. TESTING, ADJUSTING AND BALANCING. Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting, and Balancing Bureau (TABB). The prime contractor shall hire the TAB firm directly, not through a subcontractor. Perform TAB in accordance with the requirements of the standard under which the TAB Firm's qualifications are approved, i.e., AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB Standard shall be considered mandatory. Use the provisions of the TAB Standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB Standard for all aspects of TAB, including qualifications for the TAB Firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB Standard, adhere to the

manufacturer's recommendations. All quality assurance provisions of the TAB Standard such as performance guarantees shall be part of this contract. For systems or system components not covered in the TAB Standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB Standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

5.8.5. COMMISSIONING: Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Enhanced commissioning, in accordance with ASHRAE Guideline 1.1, ASHRAE Guideline 0 and LEED. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Hire the Commissioning Authority (CA), certified as a CA by AABC, NEBB, or TABB, as described in Guideline 1.1. The CA will be an independent subcontractor and not an employee of the Contractor nor an employee or subcontractor of any other subcontractor on this project, including the design professionals (i.e., the DOR or their firm(s)). The CA will communicate and report directly to the Government in execution of commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0. All buildings with Minimum LEED Silver (or better) requirement will earn LEED Credit EA3 Enhanced Commissioning.

5.9. ENERGY CONSERVATION

5.9.1. The building including the building envelope, HVAC systems, service water heating, power, and lighting systems shall meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.2. Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the buildings, including the building envelope, HVAC systems, service water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.3. Purchase Energy Star products, except use FEMP designated products where FEMP is applicable to the type product. The term "Energy Star product" means a product that is rated for energy efficiency under an Energy Star program. The term "FEMP designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent of equivalent products for energy efficiency. When selecting integral sized electric motors, choose NEMA PREMIUM type motors that conform to NEMA MG 1, minimum Class F insulation system. Motors with efficiencies lower than the NEMA PREMIUM standard may only be used in unique applications that require a high constant torque speed ratio (e.g., inverter duty or vector duty type motors that conform to NEMA MG 1, Part 30 or Part 31).

5.9.4. Solar Hot Water Heating. Provide at least 30% of the domestic hot water requirements through solar heating methodologies, unless the results of a Life Cycle Cost Analysis (LCCA) developed utilizing the Building Life Cycle Cost Program (BLCC) which demonstrates that the solar hot water system is not life cycle cost effective in comparison with other hot water heating systems. The type of system will be established during the contract or task order competition and award phase, including submission of an LCCA for government evaluation to justify non-selection of solar hot water heating. The LCCA uses a study period of 25 years and the Appendix K utility cost information. The LCCA shall include life cycle cost comparisons to a baseline system to provide domestic hot water without solar components, analyzing at least two different methodologies for providing solar hot water to compare against the baseline system.

5.9.5. Process Water Conservation. When potable water is used to improve a building's energy efficiency, employ lifecycle cost effective water conservation measures, except where precluded by other project requirements.

5.9.6. Renewable Energy Features. The Government's goal is to implement on-site renewable energy generation for Government use when lifecycle cost effective. See Paragraph 6, PROJECT SPECIFIC REQUIREMENTS for renewable energy requirements for this project.

5.10. FIRE PROTECTION

5.10.1. STANDARDS AND CODES Provide the fire protection system conforming to APPLICABLE CRITERIA.

5.10.2. Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.

5.10.3. Fire Extinguisher Cabinets: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers. The Government will furnish and install portable fire extinguishers, which are personal property, not real property installed equipment.

5.10.4. Fire alarm and detection system: Required fire alarm and detection systems shall be the addressable type. Fire alarm initiating devices, such as smoke detectors, heat detectors and manual pull stations shall be addressable. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc. shall be zoned by type and by room location.

5.10.5. Roof Access: Paragraph 2-9 of UFC 3-600-01 Fire Protection for Facilities will be modified in the next update to that UFC. Pending revision, comply with roof access and stairway requirements in accordance with the International Building Code. Where roof access is required by the IBC or other criteria, comply with UFC 4-010-01, Anti-Terrorist Force Protection, Standard 14. "Roof Access".

5.10.6. Fire Protection Engineer Qualifications: In accordance with UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES, the fire protection engineer of record shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES), or a registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified with documentation.

5.11. SUSTAINABLE DESIGN

5.11.1. STANDARDS AND CODES: Sustainable design shall conform to APPLICABLE CRITERIA. See paragraph 6, PROJECT-SPECIFIC REQUIREMENTS for which version of LEED applies to this project. The LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (AGMBC) applies to all projects. Averaging may be used for LEED compliance as permitted by the AGMBC but is restricted to only those buildings included in this project. Each building must individually comply with the requirements of paragraphs ENERGY CONSERVATION and BUILDING WATER USE REDUCTION.

5.11.2. LEED RATING, REGISTRATION, VALIDATION AND CERTIFICATION: See Paragraph PROJECT-SPECIFIC REQUIREMENTS for project minimum LEED rating/achievement level, for facilities that are exempt from the minimum LEED rating, for LEED registration and LEED certification requirements and for other project-specific information and requirements.

5.11.2.1. Innovation and Design Credits. LEED Innovation and Design (ID) credits are acceptable only if they are supported by formal written approval by GBCI (either published in USGBC Innovation and Design Credit Catalog or accompanied by a formal ruling from GBCI). LEED ID credits that require any Owner actions or commitments are acceptable only when Owner commitment is indicated in paragraph PROJECT-SPECIFIC REQUIREMENTS or Appendix LEED Project Credit Guidance

5.11.3. OPTIMIZE ENERGY PERFORMANCE. : Project must earn, as a minimum, the points associated with compliance with paragraph ENERGY CONSERVATION. LEED documentation differs from documentation requirements for paragraph ENERGY CONSERVATION and both must be provided. For LEED-NC v2.2 projects you may substitute ASHRAE 90.1 2007 Appendix G in its entirety for ASHRAE 90.1 2004 in accordance with USGBC Credit Interpretation Ruling dated 4/23/2008.

5.11.4. COMMISSIONING. See paragraph 5.8.5 COMMISSIONING for commissioning requirements. USACE templates for the required Basis of Design document and Commissioning Plan documents are available at <http://en.sas.usace.army.mil> (click on Engineering Criteria) and may be used at Contractor's option.

5.11.5. DAYLIGHTING. Except where precluded by other project requirements, do the following in at least 75 percent of all spaces occupied for critical visual tasks: achieve a 2 percent glazing factor (calculated in accordance with LEED credit EQ8.1) OR earn LEED Daylighting credit, provide appropriate glare control and provide either automatic dimming controls or occupant-accessible manual lighting controls.

5.11.6. LOW-EMITTING MATERIALS. Except where precluded by other project requirements, use materials with low pollutant emissions, including but not limited to composite wood products, adhesives, sealants, interior paints and finishes, carpet systems and furnishings,

5.11.7. CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT. Except where precluded by other project requirements, earn LEED credit EQ 3.1 Construction IAQ Management Plan, During Construction and credit EQ 3.2 Construction IAQ Management Plan, Before Occupancy.

5.11.8. RECYCLED CONTENT. In addition to complying with section RECYCLED/RECOVERED MATERIALS, earn LEED credit MR4.1, Recycled Content, 10 percent except where precluded by other project requirements.

5.11.9. BIOBASED AND ENVIRONMENTALLY PREFERABLE PRODUCTS. Except where precluded by other project requirements, use materials with biobased content, materials with rapidly renewable content, FSC certified wood products and products that have a lesser or reduced effect on human health and the environment over their lifecycle to the maximum extent practicable.

5.11.10. FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM (FB4P). The Farm Security and Rural Investment Act (FSRIA) of 2002 required the U.S. Department of Agriculture (USDA) to create procurement preferences for biobased products that are applicable to all federal procurement (to designate products for biobased content). For all designated products that are used in this project, meet USDA biobased content rules for them except use of a designated product with USDA biobased content is not required if the biobased product (a) is not available within a reasonable time, (b) fails to meet performance standard or (c) is available only at an unreasonable price. For biobased content product designations, see <http://www.biopreferred.gov/ProposedAndFinalItemDesignations.aspx>.

5.12. CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT: Achievement of 50% diversion, by weight, of all non-hazardous C&D waste debris is required. Reuse of excess soils, recycling of vegetation, alternative daily cover, and wood to energy are not considered diversion in this context, however the Contractor must track and report it. A waste management plan and waste diversion reports are required, as detailed in Section 01 57 20.00 10, ENVIRONMENTAL PROTECTION.

5.13. SECURITY (ANTI-TERRORISM STANDARDS): Unless otherwise specified in Project Specific Requirements, only the minimum protective measures as specified by the current Department of Defense Minimum Antiterrorism Standards for Buildings, UFC 4-010-01, are required for this project. The element of those standards that has the most significant impact on project planning is providing protection against explosives effects. That protection can either be achieved using conventional construction (including specific window requirements) in conjunction with establishing relatively large standoff distances to parking, roadways, and installation perimeters or through building hardening, which will allow lesser standoff distances. Even with the latter, the minimum standoff distances cannot be encroached upon. These setbacks will establish the maximum buildable area. All standards in Appendix B of UFC 4-010-01 must be followed and as many of the recommendations in Appendix C that can reasonably be accommodated should be included. The facility requirements listed in these specifications assume that the minimum standoff distances can be met, permitting conventional construction. Lesser standoff distances (with specific minimums) are not desired, however can be provided, but will require structural hardening for the building. See Project Specific Requirements for project specific siting constraints. The following list highlights the major points but the detailed requirements as presented in Appendix B of UFC 4-010-01 must be followed.

- (a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation
- (b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports

- (c) Progressive collapse resistance for all facilities 3 stories or higher. Unless determined otherwise by the Installation and noted in paragraphs 3 or 6, the building shall be considered to have areas of uncontrolled public access when designing for progressive collapse.
- (d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)
- (e) For facilities with mailrooms (see paragraph 3 for applicability) – mailrooms have separate HVAC systems and are sealed from rest of building

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

The requirements of this paragraph augment the requirements indicated in Paragraphs 3 through 5.

6.2. APPROVED DEVIATIONS

The following are approved deviations from the requirements stated in Paragraphs 3 through 5 that only apply to this project.

6.2.1 In the event of a conflict between this chapter and chapters 3 and 5, the requirements in this chapter take precedence over the requirements of chapters 3 and 5.

6.2.2 There is no need to perform a life cycle cost analysis for or to install 30% solar domestic hot water heating, as required in paragraph 5.9.4. The Government has determined it not to be life cycle cost effective for Fort Drum, NY.

6.3. SITE PLANNING AND DESIGN

6.3.1. General:

6.3 Site Planning and Design

6.3.1.1 Site Description-The proposed project is located south of Hangar Access Drive and west of Munns Corners Road. The project is to consist of a maintenance hangar addition, telecommunications room addition and Medivac room addition as well as appurtenant utilities, walks, drives, and pedestrian vehicle parking areas.

6.3.1.2 Site Demolition-Demolition is to include removal and proper and legal disposal of all material not required to be used in this project. Utility termination is to include complete and proper coordination with the respective Utility prior to performing the work. Termination is to occur back to the utility main with the appropriate caps, plugs and terminations.

6.3.1.3 Snow / Ice: Walkways and mechanical area shall be designed to maintain a safe distance from the roof lines to minimize the impact of sliding snow and ice using the (CRREL) sliding snow calculator shown in Appendix EE and available for download at HYPERLINK "http://www.crrel.usace.army.mil/products/sliding_snow_calculator/"www.crrel.usace.army.mil/products/sliding_snow_calculator/. Exterior mechanical and electrical units must have a safe distance from sliding snow and ice from the roof. Parking areas shall be designed with consideration for plowing and managing snow.

6.3.1.4 Drainage: Slope grade away from the exterior of all buildings at minimum of 2% for 20 feet to maintain positive site drainage. Grades in turfed areas shall be a minimum of 1% in the direction of drainage and a maximum of 33%. Slopes on ditches and swales shall have an absolute minimum of 0.3% and a desirable minimum of 0.5%. Storm water design shall comply with NYS DOT design manual.

6.3.1.5 Pavement Grade: Finished pavement shall be graded to assure positive drainage across the paved areas as shown on the drawings. Paved surfaces to have a minimum grade of 1.0% and a maximum grade of 2.5%.

6.3.1.6 The building finished floor shall be 6" above the surrounding grade elevation.

6.3.1.7 All exterior concrete surfaces shall receive a broom finish. Broom finish in direction perpendicular to traffic. All sidewalks shall be constructed with mesh reinforcement and of minimum strength concrete of 4500 psi and 4 inches thick unless to be used by service vehicles, those shall be 7 inches thick and reinforced. Sidewalks to be used by service vehicles shall be at least 10' wide.

6.3.1.8 Cultural Resources Inadvertent Discovery-The proposed construction area has been evaluated for potential cultural resources, consultation has been completed and concurrence achieved that any proposed construction at this location will have no impact on any significant cultural resource. However, if an historic archeological has been set aside in the vicinity of the proposed project; all posted signs will be respected by the contractor. In addition, there remains the possibility that archeological remains could be accidentally discovered during the course of construction. Examples of remains to be expected in the area could include, but not be limited to, bones, Native-American stone tools and debris, evidence of fire in the soil including fire-cracked rock, charcoal and burnt soil, Native-American pottery, evidence of historic foundations, and concentrations of historic artifacts or debris. If accidental discovery of items that appear to be cultural remains occurs during construction, all work will cease within a 10 meter radius of the find. The contracting officer shall be contacted immediately who will contact Public Works, Environmental Division, 315-722-4165, or 315-772-5708.

6.3.1.9 Excavated Materials-Excavated materials shall be legally disposed of off of the Fort Drum property.

6.3.1.10 Cultural Resources Inadvertent Discovery-The proposed construction area has been evaluated for potential cultural resources, consultation has been completed and concurrence achieved that any proposed construction at this location will have no impact on any significant cultural resource. However, if an historic archeological has been set aside in the vicinity of the proposed project; all posted signs will be respected by the contractor. In addition, there remains the possibility that archeological remains could be accidentally discovered during the course of construction. Examples of remains to be expected in the area could include, but not be limited to, bones, Native-American stone tools and debris, evidence of fire in the soil including fire-cracked rock, charcoal and burnt soil, Native-American pottery, evidence of historic foundations, and concentrations of historic artifacts or debris. If accidental discovery of items that appear to be cultural remains occurs during construction, all work will cease within a 10 meter radius of the find. The contracting officer shall be contacted immediately who will contact Public Works, Environmental Division, 315-722-4165, or 315-772-5708.

6.3.1.11 Contractor's Storage Yard-The Contractor's storage yard shall be located within the project site as approved by the Contracting Officer.

6.3.2. Site Structures and Amenities

6.3.2 Site Structures and Amenities

6.3.2 Site Demolition-Demolition is to include removal and proper and legal disposal of all material not required to be used in this project. Utility termination is to include complete and proper coordination with the respective Utility prior to performing the work. Termination is to occur back to the utility main with the appropriate caps, plugs and terminations.

6.3.2.1 Dumpster Pad: Provide a dumpster pad constructed with reinforced concrete designed for HS-20 DOT loading. Provide standard bollards at 4-feet O.C. and a minimum clearance of 2 inches between Dumpster Pad and Bollard Foundations. Screening shall be as required by the Installation and consistent with adjacent facilities. Provide space at dumpster areas for recycling receptacles and coordinate with the Installation on recycling receptacle types, sizes and access requirements.

6.3.2.2 Mechanical and Electrical Concrete Pads: Provide appropriately sized concrete pads for the exterior mechanical and electrical equipment. Pads shall be minimum 8" thick reinforced concrete slabs with areas extending a minimum of 6" beyond the exterior limits of the equipment and constructed on minimum 4" gravel base. In order to minimize settlement, wrap the 4" gravel in geotextile fabric.

6.3.2.3 Bollards: Standard bollards shall be constructed with minimum 7-foot long 8" dia. steel sch. 40 pipes filled with concrete & placed in reinforced mesh concrete foundation cylinders 24" dia. by 42" long. The bollard concrete foundations shall be located below finished grade. The bollard 8" dia. steel pipe may protrude through the concrete foundations by up to 6-inches. Removable bollards shall be constructed with standard 5-foot long 4" X Strong or Sch. 80 steel pipe (OD4" = 4.50") with welded cap and lifting bar. The permanent in ground pipe shall be 5" Sch. 80 steel pipe (ID5" = 4.813") constructed in reinforced mesh concrete foundation cylinders 24" dia. by 36" long. The top of the steel pipe shall require standard internal threads for standard screw in plug and the top of 5-inch pipe placed at the crown of the concrete foundation. All bollards shall be galvanized steel and painted.

6.3.2.4 Foundation Drip Strip: Contractor to provide a minimum 4-feet wide by 4-inches thick drip strip at finished grade around each building. The drip strip is to include geo-synthetic fabric and #2 stone with color matching the proposed building façade materials along with black aluminum edging.

6.3.2.5 Provide for ease of snow removal and storage in adjacent areas. No curbs, gutters, or islands are allowed unless specifically shown on drawings.

6.3.2.6 Exterior Door Stoppers. Provide one door stopper for each exterior door consisting of 3" dia. galvanized and painted steel Sch. 40 pipes filled with concrete & constructed in below finish grade 12" dia. concrete foundation cylinders by 36" long. These stoppers are intended to minimize damage in the event of wind gusts when opening the door.

6.3.2.7 Provide for exterior doors and corners of buildings with adjacent vehicle access: minimum 8" sch. 40 pipe galvanized steel and painted, concrete filled bollards; constructed in below finish grade foundations at minimum 36" diameter wire mesh reinforced concrete by 48" deep.

6.3.2.8 Bid Options:

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

6.3.3 Site Functional Requirements

6.3.3.1 Stormwater Management (SWM) Systems.

The Contractor(s) shall comply with Article 17 of New York State Environmental Conservation Law; Title 6, Part 750 of New York Codes, Rules, and Regulations; and the current New York State Pollutant Discharge Elimination System permit. Inclusive of this permit is the requirement for the contractor to comply with the "Stormwater Pollution Prevention Plan" (SWPPP) and prepare a site specific Erosion and Sedimentation Control Plan. The contractor shall prepare the NOI for submission. Under GP-0-10-001 the contractor is required to submit amendment to the SWPPP if design is changed after NOI is accepted by the state.

6.3.3.2 The building finished floor shall match the existing building finish floor elevation.

6.3.3.3 Storm Runoff-Storm runoff shall be calculated by the Rational Method, defined in HDS-4. The site shall be designed to maximize overland runoff routes. Any collection and closed piping system deemed necessary shall be designed for the 10-year storm frequency. Road and driveway culverts shall be designed for the 50-year storm frequency. Storm water mitigation basins shall be designed for the 100-year storm frequency.

6.3.3.4 Existing/New Storm Drainage System-The existing site is developed and is drained by natural overland flow. The existing roads, abutting the site, are drained by open ditches. Road extensions shall match the existing road's open ditch drainage design. Culverts shall be provided at all driveway access and roadway intersections to maintain the continuity of drainage flow in the ditches. On-site drainage shall be by open swales as much as possible. New manholes shall be provided at all changes in pipe direction, grade, or elevation, and where developed pipe lengths exceed 250'. The existing building roof is drained by a storm drainage system and routed to storm water mitigation basins on the south side of Hangar Access Drive.

6.3.3.5 Grades in turfed areas shall be a minimum of 1% in the direction of drainage and a maximum of 33%. Slopes on ditches and swales shall have an absolute minimum of 0.3% and a desirable minimum of 0.5%. Storm water design shall comply with NYS DOT Design Manual.

6.3.3.2. Erosion and Sediment Control

6.3.3.2 Erosion and Sediment Control

See 6.3.3.1 Stormwater Management (SWM) Systems.

6.3.3.3. Vehicular Circulation.

6.3.3.3 Vehicular Circulation.

6.3.3.3.1 See Appendix J for site plans for site vehicular circulation.

6.3.3.3.2 Contractor's Storage Yard: The Contractor's storage yard shall be located within the project site as approved by the Contracting Officer.

6.3.3.3.3 Provisions for snow removal shall be considered in all site designs.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

6.4.1 Existing Topographical Conditions

Existing Conditions: Topographic and utility information of the project site is included (accuracy +/- two feet). Contractor is responsible for verifying all existing conditions, including but not limited to existing condition features, topographic line and grade and all existing utility information including horizontal location and vertical depth and slope.

6.4.2. Existing Geotechnical conditions: See Appendix A for a preliminary geotechnical report.

6.4.2 Existing Geotechnical Conditions:

6.4.3. Fire Flow Tests See Appendix D for results of fire flow tests to use for basis of design for fire flow and domestic water supply requirements.

6.4.3 Fire Flow Tests

6.4.4. Pavement Engineering and Traffic Estimates:

6.4.4 Pavement Engineering and Traffic Estimates:

6.4.4.1 Pavement Design: Asphalt pavement design shall be in accordance with the New York State Department of Transportation Comprehensive Design Manual NYSDOT Type 2 base material, NYSDOT item #403.170 Type 3 asphalt binder course, and NYSDOT item #403.170 Type 7f asphalt top course. The pavement design shall be confirmed by the analysis of the soils data for this project based on the Contractor's geotechnical engineer's soil report.

6.4.4.2 Required at connection of new pavement to existing pavement: A straight line saw cut of the wearing top course of existing pavement a minimum of 6-inches beyond the vertical cut of the binder asphalt course and granular base course. The new wearing top course is used to bridge the vertical cut to minimize differential settlement and minimize breakdown of the asphalt surface along the joint.

6.4.4.3 Drainage-Slope drainage away from the exterior of all buildings at 1:10 for 20' to maintain positive site drainage.

6.4.4.4 Pavement Grade-Finished pavement shall be graded to assure positive drainage across the paved areas. Paved surfaces to have a minimum grade of 1.0% and a maximum grade of 2.5%.

6.4.4.5 Bid Option #1-Privately Owned Vehicle Parking (POV)-Provide paved POV parking and access roads as shown on drawing. Parking facility will include new hot-mix asphalt (HMA) pavement, markings, signage, exterior lighting and walkways.

6.4.4.6 Bid Option #2-Wash Rack-External, covered wash rack will be provided to wash rotary-wing aircraft. The assumed aircraft is CH-47. The wash rack will be located adjacent to Building 19710. Size is 150' X 100' and pavement type will be 8" thick, reinforced, Portland Cement Concrete (PCC). The wash rack will collect surface runoff into a drop inlet and route through two, in-line oil/water separators and discharge into the existing sanitary sewer system. The pavement design for the wash rack will be PCC. Ensure that storm water does not enter the sanitary system.

6.4.5. Traffic Signage and Pavement Markings

6.4.5 Traffic Signage and Pavement Markings

Shall be per New York State MUTCD. All exterior signage shall be designed and installed to accommodate the loads stated in paragraph 6.6.2.

6.4.5.1 Parking Lot-Layout shall be as shown on the drawings. Provide for ease of snow removal and storage in adjacent areas. No curbs or islands are allowed unless specifically shown on the drawings.

6.4.6. Base Utility Information

6.4.6 Base Utility Information

Utilities: Contractor to provide live/hot power, communication, gas, and water connections. If not physically possible, utility connections shall be provided as required below. Any utility outages, road closures, etc. shall be coordinated with Fort Drum agencies and may be required to be accomplished at off hours/weekends and holidays. A 14 day timeline notification shall be submitted to the Fort Drum Public Works prior to any work. All piping whose sizes are indicated in the RFP (shown on plans or in the specifications) are indicated as minimum inside diameter regardless of type of pipe. Piping provided shall not be less than this minimum diameter. The design of the water and sewer systems shall be stamped by a NYS Registered Professional Engineer and shall conform to all the requirements of the 10 State Standards & DOH Standards. Outages are not acceptable during the heating season and require 30 day advance notice.

Contractor shall receive New Your State DEC approval of the water and sewer design prior to starting any physical construction.

6.4.6.1 Marker Tape and Tracer: Provide marker tape and tracer wire for all underground pipe, conduits and duct systems, with the exception of storm sewer piping. Tracer wire test stations and termination to be contained in a test station that shall be a "TWABADJ18" - adjustable 18" tracer wire access box, by C.P. Test Services or equal. Test stations to be located at 500 feet intervals, by each valve box and the termination of the utility. Tracer wire is to be placed 6 to 12 inches above pipe, and dig tape is to be located 18 inches below grade. (Dig tape for communication duct banks is 12" and 12 inches below grade.)

6.4.6.2 Existing Utilities: Existing utilities are shown on the Site Utility Plans, as could be located by surface survey and plotted from record drawings. The Contractor shall be responsible for verifying the existence, location, size, depth and condition of the utilities.

6.4.6.3 Water:

6.4.6.3.1 Fire Hydrants: A minimum of two 6-inch bollards shall be provided around all hydrants. Four bollards are required where hydrant is exposed to 360-degrees traffic. Bollards shall be 6" galvanized and painted steel sch. 40 concrete filled pipes, constructed in below finish grade concrete foundation cylinders 24" dia. by 42" long.

All hydrants will require a 5 foot long by ½ inch diameter fiber glass pole (alternating red and white reflective bands, 4-each) mounted on a spring to the top of the fire hydrant for locating the fire hydrant in the snow. Fire Hydrants to have a 5" 'Storz ' Connection.

6.4.6.3.2 Valve and Valve Boxes: Sufficient sectional control valves shall be provided so that no more than two fire hydrants will be out of service in the event of a single break in a water main.

6.4.6.3.3 Post Indicator Valves: Post indicator valves shall be provided on water services. Tamper switches must be included on all post indicator valves on the fire lines to building. PIVs are to be a minimum of 50 feet from the building.

6.4.6.3.4 Testing and Chlorination Requirements: Water main and service lines to be tested requires 48 hour notice and approval from the COR and the Fort Drum Public Works Plumbing Shop and Environmental Division must be obtained.

6.4.6.4 Gas: Interruption of gas service to adjacent facilities, during construction, shall be minimized and restricted to the hours as permitted by the Contracting Officer. The gas service

line shall be designed in accordance with the applicable codes and local gas company, National Grid, standards.

6.4.6.4.1 Burial Depth: The minimum cover depth for gas mains and service lines shall be 30 inches. Gas piping trench shall include Marker Tape and Tracer Wire and comply with installation per paragraph 6.4.6.1.

6.4.6.4.2 Gas Line Materials: Materials for gas lines shall be Type II high density polyethylene with the PE 3408 designation SDR11 (100 PSI). Transition from underground to above ground piping shall be by anode less riser.

6.4.6.4.3 Gas Line Testing: Gas line to be pressure tested at a minimum 70 psi. Contractor shall provide a written work plan and drawing to Fort Drum Public Works for approval, a minimum 14 days prior to commencing any work. All gas piping shall be purged using nitrogen only; full nitrogen purge required, slug method is not acceptable.

6.4.6.4.4 The design of the water and sewer systems shall be stamped by a New York State registered, professional engineer and shall conform to all requirements of the "10 States Standards".

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_ELEC]

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_WATER]

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_SEWER]

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_GAS]

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_CABLE_TV]

6.4.7. Cut and Fill

6.4.7 Cut and Fill

6.4.7.1 If unclassified materials (glacial boulders, impenetrable bedrock) are encountered, the Contractor is to achieve desired elevation by suitable methods. If blasting is required, Contractor is to obtain a blasting permit from Fort Drum prior to proceeding.

6.4.7.2 Excavated Materials: Excavated materials shall be separated to satisfactory and unsatisfactory soil materials. Surplus satisfactory material shall be disposed of at the on base clean soil disposal area, approximately 6 miles from project site, as directed by Fort Drum Public Works. Unsatisfactory material (all rock, concrete, asphalt, metal, refuse and organics shall be disposed of off of Fort Drum property).

6.4.8. Borrow Material

6.4.8 Borrow Material

Training Area 6A is the location for acceptable borrow material which is available upon request.

a) Borrow request will be in writing and will provide an accurate estimate for borrow materials to include grade/side slopes, dates of usage, contractor name, hauler name and intended usage. Actual haul quantities will be provided to PW Environmental Solid Waste Manager for tracking as recycled materials.

b) The user shall stake out the corners of the designated area.

c) Provide contractor identification signs approximate size 24 inches X 24 inches at each corner of the borrow area assigned.

d) To open the pit: trees, stumps and grubbing materials will be removed.

Top soil will be removed and stored on site for reuse.

e) The borrow material calculations will be based on providing positive slope (min 1%) from the established road and when excavation is complete will provide a relatively flat surface.

f) If during excavation water is encountered the user will cease excavating and start recovery operation to restore native sand to a level that provides a 24 inch protective layer over the water.

g) If the size of the pit becomes insufficient notify PW Master Planning.

h) Edge slopes will be maintained at a maximum of 20%.

i) No spoils will be left on site.

k) All haul trucks will cover all loads.

l) All haul trucks will be clean of excess material (anything outside the box) before leaving the borrow area.

m) The contractor will provide points of convenience (rest room facilities).

n) The site is monitored and access is off post via public road ways.

For Closure:

a) Closure request shall be in writing.

- b) Top soil stored from the opening operations will be graded smooth to include the slope areas.
- c) Seeding will be provided for the closed borrow area and shall be the Fort Drum Standard for Sandy Soils.
- d) Seeding will follow contract specifications and time frames.

6.4.8.1 For Borrow Quality-All fill brought from outside Fort Drum to be used within the Fort Drum boundary shall come from a source with a valid New York State mining permit. These sources must have been subjected to archeological review and a determination of no effect issued from the New York State Office of Historic Preservation.

6.4.9. Haul Routes and Staging Areas

6.4.9 Haul Routes and Staging Areas

Haul Route: The Contractor's haul route shall be from the project site location to NYS Route 26 - (Contractor entry gate). Contractor will be responsible for repairing any damage caused by the Contractor along the haul routes during construction.

6.4.10. Clearing and Grubbing:

6.4.10 Clearing and Grubbing

Contractor shall stack saleable timber from the project site as directed by Contracting Officers Representative (COR) to a location adjacent to site. Saleable timber shall remain property of the Government.

6.4.11. Landscaping:

6.4.11 Landscaping

No additional landscaping required other than establishing turf.

6.4.12. Turf:

6.4.12 Turf

Loam & Seed: All disturbed areas shall be covered with stockpiled or imported loam a minimum of 4" and shall be seeded such that a dense grass growth becomes established.

6.5. ARCHITECTURE

6.5.1. General: To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein and shall conform with the Fort Drum's Real Property Master Plan. The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the contract or task order competition. The first priority in order of importance is that the design provides comparable building mass, size, height, and configuration compared to the architectural theme expressed herein. The second priority is that design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and installation material/color pallets, as described herein.

6.5.2. Design

6.5.2.1. Appendix F is provided "For Information Only", to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on Fort Drum's Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

6.5.2.2. The design should address Fort Drum's identified preferences. Implement these preferences considering the following:

- (a) Achievable within the Construction Contract Cost Limitation (CCL)
- (b) Meets Milestones within Maximum Performance Duration.
- (c) Achieves Full Scope identified in this Solicitation
- (d) Best Life-Cycle Cost Design
- (e) Meets the Specified Sustainable Design and LEED requirements
- (f) Complies with Energy Conservation Requirements Specified in this RFP.

6.5.2.3. Priority #1. Visual Compatibility: Facility Massing (Size, Height, Spacing, Architectural Theme, etc.) Exterior Aesthetic Considerations: The buildings massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is:

6.5 Architecture:

6.5.1 General-To the maximum extent possible, within the Contract cost limitation, the building shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein. The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the Contract or Task Order competition. The first priority in order of importance is that the design provides comparable building mass, size, height and configuration compared to the architectural theme expressed herein. The second priority is that the design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and Installation material/color pallets, as described herein.

6.5.1.2 Code Review and Fire Safety-The jurisdiction having authority on code-related matters is the U.S. Army Corps of Engineers. Refer to UFC 3-600-01, NFPA 101 "Life Safety Code", and "The International Building Code-2006" for applicable building code use and special requirements. The Contractor shall submit a complete Life Safety Plan, indicating, as a minimum, the locations of all fire doors, fire walls, egress routes, egress travel distances, etc. See Chapter 3 for specific details and requirements of the Life Safety Plan submittal.

6.5.1.3 Color Schedules-Exterior and interior colors shall comply with the current Fort Drum color matrix (refer to the Appendix). The successful Contractor must provide two (2) color boards for each exterior and interior material to the Contracting Officer and Fort Drum. Color boards must show samples of materials that will be incorporated into the project, in the proposed color (s).

6.5.1.4 Priority #1: Visual Compatibility-Facility massing (size, height, spacing, architectural theme, etc.). Exterior Aesthetic Considerations: The building's massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation.

6.5.1.5 Priority #2: Architectural Compatibility-Exterior design elements (materials, style, construction details, etc.), roofs, exterior skin, and window and door fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of the building systems.

6.5.1.6 See Appendix F for exterior colors that apply to the architectural character at Fort Drum. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.

6.5.2.4. Priority #2. Architectural Compatibility: Exterior Design Elements (Materials, Style, Construction Details, etc.) Roofs, Exterior Skin, and Windows & Door Fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of building systems.

6.5.2.5. See Appendix F for exterior colors that apply to Architectural character at Fort Drum. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.

6.5.2.6. Additional architectural requirements:

(a) Install fall protection anchor points on all roofs with a slope greater than 2:12

6.5.2 Design:

6.5.2.1 Appendix F is provided "For Information Only", to establish the desired Site and architectural themes for the area. Appendix F identifies the desired project look and feel based on Fort Drum's Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportion of fenestrations in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

6.5.2.2 The design should address Fort Drum's identified preferences. Implement these preferences considering the following:

- (a) Achievable within the Construction Cost Limit (CCL)
- (b) Meets mile stones with maximum performance duration
- (c) Achieves full scope identified in this solicitation.
- (d) Best life-cycle cost design
- (e) Meets the specified sustainable design and LEED requirements
- (f) Complies with energy conservation requirements specified in this RFP
- (g) Complies with ABA requirements

6.5.3 Exterior Design:

6.5.3.1 Flat Roof with Internal Drainage System-The roof will be a fully adhered EPDM to sheathing-covered insulation that slopes to an internal drainage system with a small parapet at the perimeter. The roof assembly will be over metal decking attached to the roof support system creating a cold roof environment to minimize ice build-up during inclement weather. The "R" value for the roof system shall be R-48. The minimum roof slope shall be at least ¼" per foot. No

insulation shall be placed directly on acoustical ceiling tiles. No exterior drains will be allowed. Roof shall withstand 100 mph wind-rated, Class A fire-resistance and Class 1-90 wind uplift resistance.

6.5.3.2 Concrete-Exposed concrete is not permitted for major exterior architectural elements, except as noted for concrete floors. Building foundations and other structural elements of concrete shall be concealed through the use of stepped brick ledges, grading, etc. All exterior concrete surfaces shall receive a broom finish. Broom finish in a direction perpendicular to traffic. All sidewalks shall be constructed of minimum strength concrete of 4500 psi and 4" thick unless to be used by service vehicles; those shall be 6" thick and reinforced.

6.5.3.3 Exterior Walls-The exterior walls will be foam-core insulated composite metal panels (R-20) to match the existing hangar. The building exterior shall comply with the Fort Drum Installation Design Guide and Public Works design standards and require approval from the Contracting Officer.

6.5.3.4 Install fall-protection anchor points on all roofs with a slope greater than 2:12.

6.5.3.5 Exterior Windows-Exterior windows shall be double or single hung windows unless otherwise noted. Due to severe local weather conditions, skylights are not allowed.

6.5.3. Programmable Electronic Key Card Access Systems:

6.5.3 Programmable Electronic Key Card Access Systems

6.5.3.1 Programmable key card to match Installation requirements.

6.5.4. INTERIOR DESIGN

6.5.4 Interior Design

6.5.4 Interior Design:

6.5.4.1 Concrete-The floor system shall be a sealed concrete slab with radiant heat on grade and the second floor shall be concrete with the finish as required per standards. Place sealer on exposed concrete floors. The sealer shall comply with ASTM C309.

6.5.4.1.1 Concrete Sealer: Place sealer on exposed concrete floors. Sealer shall comply with ASTM C 309.

6.5.4.2 Wood and Casework-The use of wood shall be limited to fire-rated shelves and cabinetry, millwork, plastic laminate mounting panels and unexposed fire-retardant-treated nailers, roof curb blocking shims, or backing for flashing.

6.5.4.3 Thermal Insulation-Minimum 2" rigid insulation (minimum R-11) shall be provided at all foundation walls of heated spaces. Extend from top of footing to underside of slab and 36" under slab perimeter. Exterior walls shall have a minimum R-20 (aged R value).

6.5.4.3.1 Vapor Barriers-A continuous vapor barrier shall be provided on the warm side of all surfaces, separating heating from non-heating spaces Provide a 6 mil. Polyethylene sheet vapor barrier under all concrete slabs on grade.

6.5.4.4 Furnishings-Furniture, appliances, and vending machines throughout the facility will be provided and installed by the Government except as otherwise noted. The Contractor shall coordinate electrical and utility connections for all appliances, vending machines and furniture. Appliances that are built-in shall be provided and installed by the Government.

6.5.4.4.1 Clear Access Space-Provide clear access space around each piece of equipment for operation, maintenance and repair as recommended by the equipment manufacturer. Other and greater access spaces where required by codes shall be provided. No piping ducts, or equipment shall infringe on access space. Where manufacturer does not provide clearance recommendations, provide 18" minimum clearance. In mechanical rooms and other mechanical spaces, locate all pipes and ducts so that walkways and equipment access areas are not obstructed, and a minimum of 78" clearance is provided above walkways and work spaces. Locate and route all piping and ducts so that piping and ducts do not have to be stepped over or stepped on to access equipment of walk-through spaces.

6.5.4.5 Doors and Hardware:

6.5.4.5.1 Building Entrance Doors-Utilize fiberglass reinforced plastic (FRP) doors at exterior locations subject to weather exposure, including the exit doors, building entrances (including both sets of doors at vestibules), mechanical and electrical rooms.

6.5.4.5.2 Overhead Doors-High, heavy-duty, industrial-grade, overhead, insulated (R-13 minimum), electrically-operated service panel doors with vision panels and provisions for emergency manual chain operation. Design for maximum local wind loads.

6.5.4.5.3 Hardware-Door hardware and security requirements must be coordinated with the functional requirements shown on the plans and electrical security/fire alarm system requirements of this RFP.

6.5.4.5.4 Locksets and Latch Sets-The locks shall be supplied with Best Mortise Cylinders or equal (Arrow and Falcon) to continue the Base Master Key System. The existing Fort Drum system is equal to Schlage, heavy-duty, commercial-lever Type with removable, 7-pin, Type L keyway. Interchangeable core locks to be compatible with existing Fort Drum "Best" manufactured locks. Building entrance doors shall be keyed alike. The Contractor shall provide 3 sets of keys for each door to Fort Drum Public Works. Coordinate keying requirements with Fort Drum and the Contracting Office.

6.5.4.5.5 Interior Doors and Frames: Unless otherwise required for sound resistance, fire protection, or ballistic containment, provide honeycomb core reinforced hollow metal doors or

flush solid core wood doors with laminate clad stile edges and faces. All door frames shall be hollow metal.

6.5.4.5.6 Hollow metal doors for all other unspecified locations: Comply with ANSI A250.8/SDI 100. Doors shall be minimum Level 2, physical performance Level "B", Model 2; factory primed. Building Entrance Doors-Utilize fiberglass reinforced plastic (FRP) doors at exterior locations subject to weather exposure, including the exit doors, building entrances (including both sets of doors at vestibules), mechanical and electrical rooms.

6.5.4.5.7 Hollow Metal Frames: Comply with ANSI A250.8/SDI 100. Frames shall be minimum Level 2, 16 gauge, with continuously welded corners and seamless face joints; factory primed.

6.5.4.5.8 STC ratings shall be of the sound classification required and shall include the entire door and frame assembly.

6.5.4.5.9 Door Closers-Provide overhead holders or closers, with hold-open capability at exterior doors to lobbies, corridors, mechanical rooms, electrical room, and janitor's closets.

6.5.4.6 Building Identification-Each building shall have a minimum of 2 sets of aluminum Helvetica numbers. Coordinate with Fort Drum personnel. Signage shall be vandal-resistant.

6.5.4.7 Toilet Accessories-All toilet accessories shall be heavy-duty, stainless steel of commercial-grade quality.

6.5.4.8 Arms Vault/Secure Storage Rooms-Provide GSA approved, Class V vault door, minimum 4'-0" wide by minimum 7'-0" high. Vault door and frame must comply with Federal Specifications QPL-AA-D-600-7. Locks shall be Underwriters Laboratories listed Group 1 or 1R combination lock. Provide a metal ramp threshold. Provide a wire-mesh, Dutch-door style day gate with shelf for arms and ammunition issue. Day gate shall have a lock operated by key and handle from the outside and by handle on the inside. It shall also comply with egress requirements and applicable codes. The combination lock shall secure the exterior and interior handles. Vault door ingress shall be by operation of the combination lock and exterior lever handles. Vault door egress shall be by interior lever handle; egress system shall be constructed to allow multiple daily uses without manufacturer reset.

6.5.4.8.1 The arms vault shall be constructed of reinforced concrete walls, floors and ceiling in conformance with AR 190-11, "Physical Security of Arms, Ammunition and Explosives, Appendix H, Attachment 2" for Category II risk category.

6.5.4.8.2 Provide arms rack cast-in anchors in the concrete floor per AR 190-11.

6.5.4.9 SIPRNET/NIPRNET Communications Rooms-Construct SIPRNET/NIPRNET communication rooms with CMU block walls from floor to roof deck for security. Ceiling shall be solid GWB construction. Provide sound insulation in walls and ceiling. Provide security measures as require by Army regulations for SIPRNET room construction.

6.5.4.10 Safety Standard Office-Provide safety standard office as shown on plan, with 2 offices.

6.5.4.11 Pilot Workroom/Crew Chief Room C-Video surveillance to be used for view of Company C work area.

6.5.4.12 Pilot Workroom/Crew Chief Room A-Video surveillance to be used for view of Company A work area.

6.5.4.13 Movable Partitions-Provide movable, acoustical partitions minimum STC 42.

6.5.4.14 Stair to Roof-Stair to roof is to be provided. It will be a straight run up to the second floor and then change to a switchback stair from that level to the roof. A platform will be provided from the second floor onto this stair as shown on the drawings.

6.5.4.15 Floors: Comply with requirements of applicable codes. Provide durable flooring materials. The floor system shall be a sealed concrete slab with radiant heat on grade and the second floor shall be concrete with the finish as required per standards. Place sealer on exposed concrete floors. The sealer shall comply with ASTM C309.

6.5.4.16 Metal Support Systems: Metal framing and furring system shall be capable of carrying a transverse load of 5 psf without exceeding either allowable stress or a deflection of L/240. Design studs and connections for cabinets, equipment, and furnishings where they occur. Design shall be based on the steel stud properties only. Provide G60 minimum galvanized coating for interior application.

6.5.4.17 Gypsum Wallboard and Ceiling Board: Shall be durable impact and mold resistant as specified under ASTM E 695 for single drop soft body impact test. Glass-mat gypsum panels shall be used as substrate for ceramic tile wall applications except at showers where cementitious backer board shall be used.

6.5.4.18 Acoustic Ceilings: Comply with requirements of applicable codes. Ceiling tiles shall be 2'x2' omni-directional, mildew/moisture resistant units.

6.5.4.19 Entryway Grille System: Provide a slab recess to accept a walk-off mat. Provide a floor drain under mat at building entrances. Floor drain in entry vestibule shall include a sediment bucket to facilitate easy cleaning and minimize clogging.

Interior building signage requirements:

[Not Supplied - PS_Architecture : INTERIOR_SIGNAGE]

6.6. STRUCTURAL DESIGN

6.6 Structural Design

6.6.1 General

Consider mission effectiveness, the most economical system in the locality, life-cycle economics, and space adaptability in choosing the structural systems. Space adaptability includes future reorganization or reallocation of space.

Analyze, design, and detail each building as a complete structural system. Design structural elements to preclude damage to finishes, partitions, and other frangible, nonstructural elements; to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable limits of the applicable material standard, e.g. ACI, AISC, Brick Industry Association (BIA).

Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. All concrete shall be a minimum of 4,500 psi and shall be reinforced. Higher strengths may be required for ballastic envelop as indicated elsewhere in the RFP. Place floor mounted mechanical and electrical equipment on a 4" minimum concrete pad.

In addition to gravity, seismic, and lateral loads, design ancillary building items (e.g. doors, window jambs and connections, overhead architectural features, equipment bracing, etc.) for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure

and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

- (a) Supporting members of glazed elements (e.g. window jamb, sill, header)
- (b) Connections of glazed element to supporting members (e.g. window to header)
- (c) Connections of supporting members to each other (e.g. header to jamb)
- (d) Connections of supporting members to structural system (e.g. jamb to foundation).

6.6.2 Applicable Standards, Codes, and Criteria

6.6.2.1 Minimum Design Wind Load Requirements: All wind loads shall be computed and applied using a wind speed of 100 mph.

6.6.2.2 Minimum Design Seismic Load Requirements: Seismic design loads shall be computed and applied using earthquake loading data as shown in latest IBC. The mapped maximum considered earthquake (MCE) spectral response accelerations for site class B are:

S_s (at short periods) = 30% g

S_1 (at 1-second period) = 8% g

The acceleration values identified are for the general location of the facility. Verify and use site specific criteria based on the final site location of the facility. Adjust site class per IBC to match specific site information in geotechnical report.

6.6.2.3 Minimum Design Snow Load Requirements: (Design per ASCE 7-05): Ground Snow Load = 70 psf.

6.6.3 Antiterrorism/Force Protection loads and minimum requirements are per UFC 4-010-01. For design of structural components subjected to dynamic loads, the U.S. Army Corps of Engineers Protective Design Center (PDC) developed SBEDS, Single-Degree-of-Freedom Blast Effects Design Spreadsheets (SBEDS). SBEDS is available at the software tab of the PDC website, HYPERLINK "<https://pdc.usace.army.mil/>"<https://pdc.usace.army.mil/>.

6.6.4 Foundation: The foundation is site specific and must be designed upon known geotechnical considerations by an engineer knowledgeable of the local conditions (e.g. highly expansive soils, groundwater levels). Coordinate the need for a vapor barrier with the architectural floor finishes and requirements of the geotechnical report. All slab-on-grade to

receive a coating (e.g. epoxy) or to receive and overlaying finish (e.g. carpet or tile), shall be underlain by a vapor barrier system with a minimum 10-mil polyethylene membrane. The minimum thickness for all vapor barriers shall be 10 mil. Minimum depth from finish grade to bottom of footings shall be 5'-6".

6.6.5 Site Features - Retaining Walls/Bridges/Etc.: Design site features (e.g. retaining walls, culverts, bridges, etc.) in accordance with the appropriate American Association of State Highway and Transportation Officials (AASHTO) criteria including AASHTO LRFD Bridge Design Specifications, AASHTO Standard Specifications for Highway Bridges, and AASHTO Guide Specifications for Design of Pedestrian Bridges. Consider operation and maintenance requirements (e.g. painting, mowing, inspecting and routine maintenance). Design site features to drain properly in order to meet loading assumptions.

6.6.6 Design Analysis: Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Results must include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.

6.7. THERMAL PERFORMANCE

6.7 Thermal Performance

6.7.1 Moisture protection shall be considered by the Contractor. Protection from damage to flooring and wall finishes shall be taken into consideration when designing floor slabs and walls. Unless otherwise directed, the International Building Code and LEED requirements for the project will dictate thermal performance.

6.8. PLUMBING

6.8 Plumbing

6.8.1 Piping Systems

6.8.1.1 Domestic water piping: No piping shall be located inside exterior wall cavities, unheated attics, or other areas subject to freezing.

6.8.1.2 Sanitary sewer piping: Plumbing vents through roof shall have a minimum height of 24 inches and shall be located as close to the roof ridge as possible and provided with adequate supports as necessary to resist forces from sliding snow and ice during winter.

6.8.2 Miscellaneous Items:

6.8.2.1 Cleanout(s) shall be provided at building service exit.

6.8.2.2 Exterior wall hydrants shall be non-freeze, exposed, anti-siphon self-draining type.

6.8.2.3 Interior hose bibs shall be equipped with anti-siphon device (integral or as attachment). Hose bibs shall be installed in each Mechanical room.

6.8.2.4 Cold-water makeup for HVAC equipment shall be by use of a hose bib equipped with an anti-siphon device to manually refill the water system. (Note: No direct water connection shall be made to the glycol system).

6.8.2.5 Floor drains with sediment buckets shall be installed in Mechanical Rooms and vestibules. Vestibules shall have floor drain(s) with depressed floor mat. All floor drains shall be provided with automatic trap primers.

6.8.2.6 All floor-mounted equipment shall be provided with a concrete housekeeping pad. Housekeeping pad shall be sized to extend at least 6 inches beyond the equipment and shall be a minimum of 4 inches thick.

6.8.2.7 Electric water coolers shall be wall mounted, stainless steel, lead free, with front and side push bars.

6.8.2.8 Water hammer arrestors shall be provided as part of the plumbing system and be a complete engineered system. Water hammer arrestors shall be specified and scheduled for use with fixtures as required by engineering calculations.

6.8.3 Note that the subject site is served by a domestic water system, with intermittent water pressures in excess of 80PSI. Hydrant flow test data is provided at Appendix D.

6.8.4.1 All storm piping above the floor shall be insulated. Insulation and jacket shall be continuous through the walls, floors, and hangers.

6.8.4.2 Emergency eyewash stations will be located in maintenance areas. Provide a floor drain piped to the sanitary system.

6.8.4.3 Oil/Water Separators-Oil/water separators shall be Rockford OST or approved equal, flow-through type with extension to the surface, sized to match the flow demand. The oil level in each separator shall be monitored since it is the practice of Fort Drum to have the building DDC system monitor the oil level in the separator.

6.8.5 Water

6.8.5.1 Fire Hydrants-Bollards shall be provided around all hydrants. All hydrants will require a 5" long by 1/2" diameter fiber glass pole (alternating red and white reflective bands, 4-each) mounted on a spring to the top of the fire hydrant for locating the fire hydrant in the snow. Fire hydrants are to have a 5" Storz connection. Provide bollards as described in 6.3.14.3.

6.8.5.2 Valve and Valve Boxes-Sufficient sectional control valves shall be provided so that no more than 2 fire hydrants will be out of service in the event of a single break in a water main.

6.8.5.3 Post Indicator Valves-Post indicator valves (PIV) shall be provided on water services. Tamper switches must be included on all post indicator valves on the fire lines to the building. PIVs are to be a minimum of 40' from the building.

6.8.5.4 Testing and Chlorination Requirements-Water mains and service lines to be tested require a 48-hour notice and approval for the COR and Fort Drum Public Works Plumbing Shop and Environmental Division.

6.8.6 Gas-Interruption of gas service to adjacent facilities, during construction, shall be minimized and restricted to the hours as permitted by the Contracting Officer. The gas service line shall be designed in accordance with the applicable codes and local gas company, National Grid, standards. Bollards will be installed to protect meter installation.

6.8.6.1 Burial Depth-The minimum cover depth for gas mains and service lines shall be 30".

6.8.6.2 Gas Line Materials-Materials for gas lines shall be Type II high-density polyethylene with the PE3408 designation SDR11 (100 psi). Transition from underground to above ground piping shall be with an anode-less riser.

6.8.6.3 Gas Line Testing-Gas lines to be pressure tested at a minimum 70 psi. Contractor shall provide a written work plan and drawing to Fort Drum, for approval, a minimum of 14-days prior to commencing any work. All piping 2" and larger shall be purged, using nitrogen only, with a full nitrogen purge required. The slug method is not acceptable.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.9 Site Electrical and Telecommunications Systems

6.9.1 Exterior Electric Power:

6.9.1.1 Primary Power: Obtain primary 13.2/7.62 kV 3-phase power from the solidly grounded 3-phase, 4-wire electrical distribution system. Primary electrical service is routed to existing pad-mounted transformer located outside of each existing facility. Building 19710 (3.10 Hangar) is currently served by and underground feeder from the 13.2 kV distribution system via the fused sectionalizing terminal FT-X6. The #2/0 primary conductors are protected by a 200 amp fusing in FT-X6. The transformer will be replaced, but the existing primary circuit to the hangar facility transformer shall be re-used.

6.9.1.1.1 The layout and location of ducts, manholes, handholes, etc. shown on the Civil site utility plans are approximate.

6.9.1.1.2 Provide an underground reinforced concrete encased duct bank with within 20 feet of the limits of the road. All manholes within this limit shall be designed for HS-25 vehicle loading.

6.9.1.1.3 Minimum cover for the primary power duct bank shall be 36" for 15 kV conduits with 15 kV cables.

6.9.1.1.4 Medium-voltage cable joints shall comply with IEEE Std 404 and IEEE Std 592. Medium voltage cable terminations shall comply with IEEE Std 48. Splice kits shall be of the pre-molded splice and connector type. Joints used in underground facilities shall be certified by the manufacturer for waterproof, submersible applications. Tape type splices are not acceptable. Medium-voltage cable joints shall be made by qualified cable splicers only. The Government reserves the right to require the cable splicer to make a demonstration or sample splice for approval. Underground splicing kits shall be 15 kV class RTE type BOL-T connectors or equal and terminations at the medium-voltage sectionalizing switch 600 ampere terminations shall be 15 kV class, separable insulated connectors, type BOL-T connectors, or approved equal. All 200A terminations shall be by load break elbows.

6.9.1.1.5 Fault and Overcurrent Protection: Line-side and load-side overcurrent and fault protection devices shall be coordinated to isolate any electrical fault from the rest of the system and for all overload conditions. After contract award, the Contractor shall contact the Contracting Officer to obtain the information (i.e., site one lines, etc.) necessary to provide this coordination.

6.9.1.1.6 Use 600 amp deadbreak junctions with 600 amp tee body connections in manholes. Fire wrap all exposed cable in manholes and crimp neutral connections.

6.9.1.2 Primary Conductors: The primary conductors to the facility shall remain. The phase conductors on the line side of the fuse terminals shall be single copper conductor 15kV, 133% insulated, type MV90, with a semi-conducting shield, and EPR insulation, 500 kcmil with a #4/0 neutral with USE/XHHW insulation. All neutral connections shall be made with irreversible permanent connector. The phase conductors (primary cables) downstream of the sectionalizing switch shall be single copper conductor 15kV, 133% insulated, type MV90, with a semiconductor shield, and EPR insulation sized per NEC for the loads, but shall be a minimum of #2. Provide #2 copper ground wire with USE/XHHW insulation with the phase conductors.

6.9.1.2.1 The existing 1500 kV transformer currently serves the hangar facility. This will be replaced with a new transformer in the same location. The Design-Builder will design, procure, and install the correct kVA transformer. Bollard protection shall be provided. New pad-mount transformer shall be 3-phase, 13.2 kV, delta primary with 480Y/227 volt, ground wye. The primary side transformer compartment shall be dead front with load-break elbow terminations, load-break oil immersed switch and draw-out, dry-well mounted current-limiting fuses, with primary surge arrestors. The primary feeder shall be connected to one set of bushings, and the surge arrestors shall be connected to the second set of bushings.

6.9.1.2.2 The transformer secondary compartment shall be live front with NEMA pattern spade terminations. The neutral connections shall be solidly grounded.

6.9.1.2.3 Provide 8" schedule 80 concrete filled bollards to protect transformers and fused terminals from vehicular traffic where required.

6.9.1.2.4 Provide curb and containment of transformer oil per standards in National Grid Electric Service Bulletin 750, 754 & 759. Available at HYPERLINK

"http://www.nationalgridus.com/niagaramohawk/construction/3_elec_specs.asp"http://www.nationalgridus.com/niagaramohawk/construction/3_elec_specs.asp

6.9.2 Grounding

6.9.2.1 Grounding Systems: All underground bonding connections shall be made with exothermic welds. The maximum resistance to ground shall be 10 ohms. Special Grounding-For Building 19710, provide a continuous ground bus in the Avionics Room. Provide a grounding point in the Engine Shop, the Hydraulic Shop, the Prop and Rotor Shop, and the Sheet Metal Shop. The grounding bus or grounding point shall be installed at 5'-4" above the floor. The ground connection shall be attached to the building electrical system to provide a maximum resistance to ground of 10 ohms.

6.9.2.2 Building Grounding-The building expansion will have a ground grid around the building perimeter for grounding the incoming service, building steel, telephone service, incoming water pipe, lightning protection system, and internal grounding requirements. Ground straps will be provided in areas where needed and connected to the building grounding system. The new ground loop will be connected to the existing building grounding system.

Hangar Bay Maintenance Floor and Parking Apron Grounding Requirements-The in-floor ground system is existing.

Fence Grounding-Connect each fence terminal pot, corner post, and gate post to a 16mm X 3.1mm (3/4" X 10") copper clad, steel ground rod.

6.9.3 Communications Utilities

6.9.3 Communications Utilities:

6.9.3.1 All splices, terminations, and cutovers on each end of all cables, and within the cable runs shall be performed by Design-Build Contractor. Where existing manholes or handholes do not contain fiber mesh or sufficient cable racking, they shall be added by the contractor. The installation of the system shall be turnkey.

6.9.3.2 Provide 3-4" conduits from the communications manhole at the telephone point of connection to each building. The conduits shall be used for telephone, data, cable TV (CATV). Provide a three-inch, three-cell fabric mesh innerduct including non-abrasive pull-string in the data conduit. The CATV conduit will be used by the CATV installer to access the manhole and its attached duct bank system. The CATV installer will use one of the fabric mesh innerduct envelopes. All installations shall meet I3A requirements, which may require additional racking grounding, and sealing ducts in existing structures.

6.9.3.3 Exterior CATV cables will be provided by others.

6.9.3.4 All utility meters shall be connected to the DDC system with cat 6 copper or fiber optic cables.

6.9.3.5 Cable TV: The CATV installer (Time-Warner) will provide the cable from the manhole to each building in the conduit provided by the Design-Build Contractor to the point of demarcation in the main Communications Room.

6.9.3.6 Additional Requirements: In addition to any requirements specified in I3A, the following shall be provided:

- (a) Galvanized racks, ground rods and sumps for all hand holes.
- (b) Use fusion splice end connectors feeding all fiber to racks.
- (c) Communication Outlet density shall be a minimum of two per room irregardless of the number of users per room.
- (d) Provide 100% spare rack space plus 1 extra rack.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.10 Facility Electrical and Telecommunications Systems

6.10.1 Interior Electrical System:

6.10.1.1 Voltage drop shall be limited to 1% on the service conductors and 5% from the building's main distribution panel to all loads (2% for feeders and 3% for branch circuits), unless otherwise noted. Voltage drop calculations shall be based on estimated demand loads plus 25% future load growth. In addition, base voltage drop calculations on a 12 amp load for vending machines (all on dedicated circuits). All loads shall be assumed to be at 90% power factor.

6.10.1.2 Over-Current Protective Devices-Over-current protective devices shall be coordinated such that only the device closest to a fault trips or opens. All feeders and branch circuits shall have a dedicated neutral conductor and insulated equipment grounding conductor and shall be installed in conduit.

6.10.1.2 Provide at least 1 spare conduit, which shall be the same size as the conduits with wires, from the transformer to the electric room. Provide pull cable in spare conduits and cap each end.

6.10.1.3 Service Entrance-Provide a 3000 Amp switchboard in the newly created electrical room. Tie the main bus of the MDP to the load side of the bus of the new main switchboard (after the main 2500 A breaker). Locate the service entrance equipment to allow for the addition of a future switchboard section.

6.10.1.3.1 The building shall be fed from the transformer via type USE secondary conductors in an existing underground, non-reinforced concrete encased duct bank. Provide at least 2 spare conduits, which shall be the same size as the conduits with wires, from the transformer electric room. Minimum cover for the service duct bank shall be 24", or as shown on the site plan if greater.

6.10.1.3.2 Meter-Provide current transformers and a meter capable of reading volts, amps, KWH, and peak demand. The meter shall be located on the main switchboard. The meter shall also provide an output that can be read by the Building Management System (BMS). Provide a connection from the meter to the BMS.

6.10.1.3.3 The main switchboard shall contain a single circuit breaker rated at 2500 Amps. Provide ground fault protection on the main circuit breaker as required by the National Electric Code. Other downstream feeder and branch circuit protection in panel boards shall also be provided by circuit breakers.

6.10.1.3.4 Provide transient voltage surge suppression (TVSS) at the service entrance. Provide TVSS with L-L per phase, L-N per phase, and N-G. Also provide TSS for the communications room circuits.

6.10.1.3.5 Ground fault protection for feeder circuit breakers is not required.

6.10.1.4 Feeders-The minimum size for a panel board feeder shall be 100 amps.

6.10.1.5 Stepdown Transformers-Provide dry-type stepdown transformer (480-208Y/120 volt, 3-phase, 4-wire) in electrical room as required to supply power to loads.

6.10.1.5.1 Transformers shall be furnished with standard accessories and at least 4 taps (2-2.5% above and below normal voltage).

6.10.1.5.2 Transformers shall be Energy Star rated.

6.10.1.5.3 Transformers shall be K-rated where recommended by IEEE 110, "Recommended Practice for Powering and Grounding Electrical Equipment".

6.10.1.7 Panelboards:

6.10.1.7.1 All panelboards, including the main circuit breaker, switchboard and/or main distribution panelboard, shall be fully rated for the available fault current. All panel boards shall be furnished with a main circuit breaker. All panel boards shall have copper busses. Full-sized, bolt-on branch breakers insulated neutral busses and equipment grounding busses shall be provided. Panel boards shall be recessed in finished areas and surface mounted in unfinished areas, with flush fronts and hinged doors. All panel boards shall be concealed in finished spaces behind doors where required or may be surface mounted in mechanical or electrical rooms.

The Armaments Room, Engine Shop, Hydraulic Shop, Prop & Rotor Shop, and Sheet Metal Shop shall have its own, individual, 12-circuit, 240/120 volt, 3-phase, 3-wire panel board. The panel boards shall be fed from a 240/120 volt distribution panel board located in the electrical room. These panel boards shall be used for connection of shop tool receptacles. One 480Y/227 volt and 208Y/120 volt panel board will be installed in the new administration addition.

6.10.1.7.3 The main distribution panel/switchboard shall have a minimum of two spaces suitable for future 400 amp, 3 pole circuit breakers. In addition, provide one spare 225 amp, 3 pole and one spare 100 amp, 3 pole circuit breaker in the main distribution panel/switchboard.

6.10.1.7.4 Panelboards that serve computer and data processing loads shall be dedicated to these loads and other loads such as HVAC, lighting, and other building loads shall be served by separate panels. This requirement does not apply to HVAC equipment with motors less than ½ horsepower.

6.10.1.7.5 All panelboards serving harmonic loads that comprise over 50% of the load shall be provided with 200% rated neutral busses and 200% rated neutral feeders. Each panelboard serving harmonic loads shall be protected by a TVSS system.

6.10.1.7.5.1 Individual personal computers on user desktops shall not be considered data processing loads for this purpose. This requirement applies to server rooms and similar spaces.

6.10.1.7.6 Provide a minimum of 20% empty space for all panelboards in accordance with UFC 3-520-02 Interior Electrical Systems.

6.10.1.8 Branch Circuits, Receptacles and Outlets: All general receptacle and lighting circuits shall be 20 ampere circuits and fed by 20 ampere circuit breakers.

6.10.1.8.3 Provide electrical requirements for electric operators on all sinks, urinals and toilets. Battery operated units are not acceptable.

6.10.1.10 Special Power Requirements

Electrical power outlets for special power shall be coordinated with work bench locations in shops, and provided in the maintenance areas. It is expected that one quad receptacle shall be located every 4 feet over work bench spaces in the shop areas.

6.10.1.10.1 In the Briefing rooms, on the second level of the addition, provide separate power receptacles and data ports every 30" around the room and located at a height of 18" above the floor. Wiremold is not allowed.

6.10.1.11 Hazardous Locations-Hazardous locations shall be clearly defined by the Designer, based on the intended use of the facility and applicable criteria. Receptacles, devices, equipment and wiring in hazardous locations shall be designed (UL listed for the application) and installed in accordance with the NFPA Codes. When hazardous locations are determined to be up to 18" above the finished floor such as hangar maintenance bays, receptacles and devices and conduit routing to them shall be installed above the hazardous area at a minimum of 44" above the finished floor to the bottom of the back box.

6.10.1.12 400Hz Aviation Power Supplies-400 Hertz (Hz) power supplies are existing in both the Blackhawk hangar and the Chinook hangar. Each 400Hz power supply is rated with the following input rating: 480V, 3-phase, 70kVA, 60Hz. The power supply has the following output rating: 208Y/120V, 3-phase, 400Hz. Each power supply shall feed two new and two existing pin-in-sleeve, wall-mounted receptacles.

6.10.1.12.1 A pin-in-sleeve receptacle shall be placed on either side of each aircraft door, and directly across from the side of each aircraft door on the opposite wall of the hangar bay. A receptacle shall be installed on each wall in the Chinook hangar bay. The receptacle model shall be ADR 1044, 100 amp, 4-wire, 4-pole, Style 1 receptacle. At each receptacle, place a 600 volt, 100 amp, 3-phase, Type 1 disconnect.

6.10.1.13 28VDC Aviation Power Supplies-28VDC power supplies with 4 receptacles are existing in both the Blackhawk and Chinook hangars. Provide 4 additional receptacles at each long-way end of each of the 2 maintenance bays. The receptacle model shall be coordinated with the specific requirements of the aircraft. At each receptacle, place a disconnect switch.

6.10.2 Lighting: All luminaries shall be heavy commercial (specification) grade.

6.10.2.1 Exterior Lighting: Luminaries shall be high pressure sodium, cutoff type and include shields to minimize light trespass. Metal halide luminaries with pulse-start ballasts are permitted where necessary to match existing nearby luminaries, in locations with security cameras, and where color rendition is important. All exterior lighting circuits shall be underground and trenches shall use Tracer Wire and Marker Tape.

6.10.2.1.1 In addition to the locations specified under paragraph 3.0, lighting shall be provided for the streets (where not already existing), access roads, sidewalks, in exterior canopies if provided, pavilions (if provided), recreation facilities and formation areas (if provided), and

above all exterior doors. The actual number and locations of luminaries shall be determined by the Engineer of Record. Placement of lighting fixtures shall near building penetrations such as louvers, intakes, etc. shall consider that insects are attracted to light, and shall be avoided where practical.

6.10.2.1.2 Pole assemblies shall be rated for 110 mph. Poles and fixtures shall match the style and type of existing. Furnish and construct light poles on raised concrete foundations to prevent damage from vehicles that accidentally hit lighting units. Poles for parking areas shall be metal, 30' high and shall be installed on 3'-4" high concrete pedestals. Poles for sidewalks shall be metal and approximately 15' high. Pole assemblies shall be rated for 110 mph winds. Poles shall match the style and type of existing poles.

6.10.2.1.3 Exterior luminaries shall be controlled by the DDC system via an electrically held magnetic lighting contactor with a hand-off-auto switch located in the electric or mechanical room.

6.10.2.1.2 Cut-off style HID luminaires shall be provided above each exterior door and along the Northeast exterior wall of the addition. The wall-mounted fixtures shall be the same as the existing fixtures on the hangar buildings.

6.10.2.1.4 Provide a photometric plan that does not exceed 2 lumens/SF beyond edge of pavement and sidewalks or edge of lawn areas. Specify light types to include lamps, height, shields and mounting criteria. Photometric plans shall be stamped by a Professional Engineer.

6.10.2.2 Interior Lighting: All interior luminaries shall be energy efficient fluorescent.

6.10.2.3 Interior Lighting-Provide luminaires for all rooms and interior areas. All interior luminaires shall be fluorescent and shall be controlled from wall-mounted switches in each room. All switches shall be ivory with ivory nylon cover plates. Provide 3 and 4-way switches as required for rooms with multiple entry points. A lighting control panel shall be provided for the existing aircraft hangars.

6.10.2.3.1 Provide occupancy sensors in the latrines, break rooms, and closets, or otherwise requested by personnel. Occupancy sensors shall be dual technology type (infrared and ultrasonic or microphonic). Where compact fluorescent are used, lamps shall be hard-wired type and not self-ballasted, screw-in type.

6.10.2.3.2 Provide 4', 6-lamp, 54 watt, F54T5HO fixtures for lighting of the hangar areas.

6.10.2.3.3 U-bent fluorescent and incandescent lamps shall not be used.

6.10.2.4 Interior Lighting Illuminance-In spaces with an acoustical ceiling tile, the fixtures shall be 2' by 4', fluorescent using F32T8 lamps. In spaces without a finished ceiling, the fixtures shall be industrial turret style and surface or pendant-mounted using F32T8 lamps. The fixture layout

must be coordinated with the traveling bridge crane requirements. Illumination levels will be in accordance with the IESNA Lighting Handbook. Maintained illumination levels will be in accordance with Table 6.1.

Table 6.1
Lighting Levels

Functional Area:	Foot Candles:
Aviation Maintenance Bay	50
Blade Shop	50
Engine Shop	50
Prop & Rotor Shop	50
Satellite QAR	50
Satellite PC-QC	50
Storage Areas	50
Offices	50
Computer Areas	50
Sand & Prep Room	30
Bond-Balance Room	30
Tool Room	30
Mechanical Room	30
Electrical Room	30
Restrooms	30
Corridors	20
Entryways	20

Table 6.2 Convenience
Outlet Densities

Functional Area:	Area Per Outlet (SF)
Offices	80
Briefing Rooms	80
Bench Stock	80
Armament	80
Supply Rooms	80

Shop Rooms	80
Crew Chiefs	50
Tech Supply	50
Ops Rooms	1500
Break Rooms	1500
Avionics	1500
Shops	1500
Arms Room	1500
PLL	1500
Medical PLL	1500
Latrines	1500
Showers	0
Corridors	0
Lockers	0
	0
Maintenance PLL	Every 30"
Maintenance Hangar	Every 50'
Storage Hangar	Every 50'
Bld. 2070 Storage Area	Every 50'

6.10.4 Communications Utilities

6.10.4 Communications Utilities: Communications utilities include telephone, fiber optic, and cable TV. All installations shall meet I3A requirements.

6.10.4.1 The Design-Build Contractor shall provide equipment racks, cabinets, fiber and copper patch panels, grounding equipment, service entrance equipment (including protectors and cross-connects), "110" punch down blocks, all conductors and outlets throughout the building. All horizontal copper cabling shall be rated for the present level of Category 6 cabling as approved by EIA/TIA standards. The Contractor shall make all required connections for both telephone and data systems both inside and outside the building to make for a complete turnkey installation. The entire horizontal distribution cabling system link for data and telephone systems shall be part of the manufacturer's warranted cabling solution, including patch cords. The design documents shall include data rack layouts and elevations showing each type of patch panel and equipment space required.

In addition to the I3A requirements, two 120V, 20 amp quad receptacles each with a dedicated circuit shall be placed on the telephone backboard in each telecommunications room, and one 120V, 20 amp quad receptacle shall be placed on each rack.

Note the following are requirements of I3A:

Provide a dedicated electrical panel for each TR with the following minimal requirements: 120/208 volt (V), 3-phase, 30-space panel with a minimum 100-Ampere (A) total capacity. All loads within the TR shall be fed from the dedicated TR panel and not from other branch circuits. Loads shall include, but are not limited to, receptacles, servers, UPS, data switches, and HVAC systems (including exterior units for split systems). A minimum of 30A spare capacity shall be reserved in each TR panel with a minimum of four unused spaces for future loads. In accordance with TIA/EIA-569-B, lighting fixtures should not be powered from the TR's electrical panel.

6.10.4.3 Provide communications rooms in the building such that no data/telephone cable will be longer than 250 feet between patch panel and work area jack, including 10 feet of slack in the TR and 3 feet of slack above the outlet. If fiber is used, long runs are allowed, see paragraph 3.1.9(f) of Part II of UFC 4-214-02.

6.10.4.4 The Contractor shall make all final connections of the building telephone system at the main telephone cross connect and between each communications rooms. Backbone cables for voice between communications rooms shall be multiple 25 pair bundle cables. Backbone cables shall be sized as follows: 2 pairs for each telephone plus 25% spare capacity.

6.10.4.5 12-strand single mode fiber optic cable shall be used as the backbone cable between the main communications room and each remote communications room. All fiber optic cables shall be installed in innerducts and in accordance with I3A.

6.10.4.6 The Contractor shall provide a complete and usable (turnkey) data networking system including but not limited to all routers and servers. The Contractor shall make all final connections for both the fiber optic and copper data system cables, including patch cords, and between each communications room. The Contractor shall furnish to the Government 5% spare patch cords for copper cables and 25% spare patch cords for fiber optic cables.

6.10.4.7 Provide 4 pair, EIA/TIA 568B, category 6, unshielded twisted pair (UTP), #24 AWG, solid copper, plenum rated cables for both telephone and data systems to all data jacks.

6.10.4.8 All horizontal cables from data and telephone jacks shall be terminated on rack mounted patch panels with 110 style IDC connectors. All components shall be CAT 6 rated.

6.10.4.9 Provide, connect, and test a dedicated fiber optic communications link for the Building Management System (BMS). Coordinate specific requirements with the equipment manufacturer. Fiber optic cables shall be used to connect the BMS to the main Ft Drum Energy Management and Control System.

6.10.4.10 Provide fiber optic connections to the fire alarm and mass notification systems as required.

6.10.4.16 Additional Requirements: In addition to any requirements specified in I3A, the following shall be provided:

- (a) Use fusion splice end connectors feeding all fiber to racks.
- (b) Communication Outlet density shall be a minimum of two per room regardless of the number of users per room.
- (c) Provide 100% spare rack space plus 1 extra rack.

6.10.3.1 Telecommunication Pathways and Cabling-Telecommunications outlets and conduits will be provided in core areas and supply administration areas with a minimum of one outlet in each work area. In administration and shop control areas provide an outlet for each work station. Provide mechanical and electrical rooms and corridors with outlets for wall-mounted (GFGI) phones. For controlled access facilities, provide outlets for wall-mounted (GFGI) phones at the primary entrance. Additional locations may be provided based on coordination with the facility user. Provide outlets per I3A Technical Guide and Table 6.2 below. Provide 120VAC duplex outlet at a minimum distance of 16" of each communication outlet and a maximum distance of 24". Additional outlet locations must be provided based on coordination with the facility user. Provide 120VAC duplex outlets for each communication outlet.

6.10.3.3 Telephone and Data Systems:

6.10.3.3.1 Provide complete telephone and data cable systems for the addition.

6.10.3.3.2 The contractor shall provide equipment racks, cabinets and copper patch panels, grounding equipment per base design standards and I3A Technical Guide.

6.10.3.3.3 Contractor to provide service entrance equipment (including protectors and cross-connects) all conductors and outlets throughout the building. All horizontal copper cabling shall be rated for the present level of Category 6 cabling as approved by EIA/Tia standards. The contractor shall make all required connections for both telephone and data systems both inside and outside the building. The entire horizontal distribution cabling system link for data and telephone systems shall be part of the manufacturer's warranted cabling solution, including

patch cords. The design documents shall include data rack layouts and elevations showing each type of patch panel and equipment space required. Contractor shall verify this requirement in their design.

6.10.3.3.4 The existing copper service to the hangar facility is 25 pair. This needs to be upgraded to 325 pair. To accomplish this, a new duct bank system shall be provided consisting of 6 precast manholes and approximately 10, linear feet of underground duct bank. This shall be coordinated with NEC.

6.10.3.3.5 An existing 36 strand, single-mode, fiber optic cable is brought to the hangar facility. The cable shall be located to the new communications room, constructed as part of the addition. All terminations to fiber shall be made with factory polished SC connectors with a pigtail and fusion splice, as required by NEC. This shall be coordinated with Fort Drum NEC.

6.10.3.3.6 The existing communications panel located in the mechanical room shall be relocated to the new communications room built as part of the addition. All existing communication cabling shall be extended from the existing communications panel to the new communications room.

6.10.3.5 Station Outlet-All information outlets (telephone and data) shall have 3 jacks (triple 8-position connectors) with voice on top and data on the center and bottom. Voice jacks shall have white or green color, and data jacks shall have blue color. Jacks shall be provided per I3A Standards.

6.10.3.6 Patch Panels-All horizontal cables from data and telephone jacks shall be terminated on rack-mounted patch panels with 110 style IDC connectors. Two-3meter long patch cords shall be provided with each horizontal link. All components shall be Category 6 rated.

6.10.3.6.1 All patch panels for the telephone/data system shall be mounted in 19" wide EIA/TIA floor-mounted open racks. All patch panels shall be sized for 25% spare capacity and shall be sized to accommodate User-provided network electronics. Coordinate rack layouts with Fort Drum NEC.

6.10.3.7 Wall Telephones-Connect all 8-position type wall telephone outlets from the telephone terminal back board with one, 4-pair Category 6, UTP cable.

6.10.3.8 Station Outlet Locations-Flush outlets shall be provided in finished rooms. Surface-mount outlets shall be provided in unfinished areas. Wiring shall be homerun (star) style. Place outlets in the floor of the briefing rooms. The location is to be determined during design.

6.10.3.9 Raceway Requirements-Communications cabling shall be installed in 1 "EMT conduit from the cable trays to each communication outlet. Provide cable trays for horizontal distribution to the maximum extent possible.

6.10.3.9.1 All telephone and data homeruns shall be concealed in finished spaces. See Criteria 6.3 for definition of finished spaces.

6.10.3.9.2 The Contractor shall terminate all outlets to patch panels.

6.10.3.10 Cable TV-The CATV installer (Time-Warner) will provide the cable from the manhole to the conduit provided by the Contractor to the point of demarcation in the communications room. The Contractor shall provide all necessary CATV cables and connectors in the building,

including, but not limited to, outlet boxes, jacks, face plates, and cables from the point of demarcation in the first floor communications room to each individual CATV outlet in the building.

6.10.3.10.1 There shall be individual home runs for each outlet to the junction boxes in the communications room on each floor.

6.10.3.10.2 The Brief Room shall have 2 separate CATV outlets located in the separate sides of the room. One cable shall be provided in the Break room, Flight Ops, ALSE, Pilot Ops, each office and Safety.

6.10.3.10.3 Provide cable in cable tray for main horizontal cable runs. Conduit shall be provided for vertical runs or in areas subject to physical damage. All CATV homeruns shall be concealed in finished spaces. See Paragraph 6.3 for the definition of finished spaces.

6.10.3.10.5 Provide individual RG-6 type CATV cables from the communications room backboard to each CATV outlet. Cables shall be bonded foil with tri-shield construction, 77% braid, non-bonded tape, with flame-retardant PVC jacket and shall meet National Electrical Code 820 V rating. Provide Type "F" connectors at both ends of all cables.

6.10.3.10.6 Provide flush-mount boxes, jacks, adaptors, and covers for all CATV outlets. Connect the CATV cables to all boxes.

6.10.4.12 The Design-Build Contractor shall provide a point of demarcation as required by Time Warner Cable and shall make all connections downstream from the point of demarcation. There shall be individual home runs from each outlet to the junction boxes in the communications room.

6.10.4.13 Conduit shall be provided for in areas subject to physical damage. All CATV home runs shall be concealed in finished spaces.

6.10.4.14 In addition to the requirements in the previous paragraph, the Contractor shall provide 3/4" conduits from the cable trays to the CATV outlets in all rooms.

6.10.4.15 Provide flush mount boxes.

6.10.3.10.8 All work shall meet Time-Warner Cable Standards.

6.10.3.11 Intrusion Detection System (IDS)-An IDS system shall be provided as specified in part 3 of this specification section. Each IDS shall be procured and installed in accordance with AR 190-11 and the Fort Drum Installation Design Guide. The Contractor shall provide a complete intrusion detection system, including all necessary equipment, cables and testing. This requirement takes precedence over statements to the contrary elsewhere in this RFP.

6.10.3.11.1 IDS shall be by Advantor Systems Corporation for seamless integration into the Post central security monitoring station located in Building 10715. The closed circuit television portion of the IDS shall be by OzVision Remote Video Solutions for seamless integration into the Post central security monitoring station located in Building 10715. The system requires a dedicated power source, dedicated phone line, and LAN connection for CCTV. Transmission lines for the alarm circuit will have line supervision to detect tampering or malfunction and meet specific requirements such as minimum gage, shielded and twisted pair. The hardware communications link will be enclosed in metallic conduit from the protected area to wherever the communications is made to the telephone network.

6.10.3.11.2 Components for typical Arms Room include: Advantor control panel, LCD key pad, proximity card reader, balanced magnetic switch, motion sensor, microphone, duress switch, CCFV camera, strobe light and sensors (sensors will have tamper switches). Installation may require additional equipment to send alarm signals, video signals and audio to the monitoring console in Building 10715. Components will be installed in the following locations:

- (a) Control panel will be on the wall inside the Arms Room opposite the door hinge.
- (b) LCD key pad will be on the control panel inside the Arms Room.
- (c) Proximity card reader will be on the control panel inside the Arms Room.
- (d) Balanced magnetic switch will be at the top of the vault door inside the Arms Room.
- (e) Motion sensors (dual sensor type) will be on the ceiling of the Arms Room at the opposite end from the control panel to allow coverage of the entire interior of the Arms Room.
- (f) Microphone sensor will be on the control panel inside the Arms Room.
- (g) Manual duress switch will be near the control panel inside the Arms Room.
- (h) CCTV camera will be inside the Arms Room and be capable of viewing the control panel, door entrance, and surrounding area. Strobe light and siren will be outside the building over the nearest entrance to the Arms Room.
- (i) Provide 100 proximity key fobs per installed control panels.

6.10.3.12 Classified Secure Communications (SIPRNET)- Installation shall be in accordance with DCID 6/9 and AR 380-5 Standards. This building shall be provided with a separate, secure classified SIPRNET communications/telecommunications service entrance/closet. Open data and voice racks shall be provided in each secure communications rooms with minimum 12-strand single-mode fiber optic patch panel and minimum 24-port Category 6 patch panels. A 12-strand single-mode fiber optic cable and a 25-pair voice cable shall be run to the non-secure telephone/communications room. Each SIPRNET horizontal conduit shall be homerun back to the service closet.

6.10.3.12.1 Provide SIPRNET outlets in each of the following rooms: Commanding Officer's office, Commander's conference room, XO's office, S-2, S-3. Coordinate with the Contracting Officer for the exact location within these rooms. Installation shall meet the requirements of I3A and the SIPRNET Technical Guide.

6.10.3.13 Paging System-Provide a complete paging system throughout the Blackhawk hangar, Chinook hangar, and 3-10 Maintenance addition. The system will be zoned for multiple bay operations and will have input from the telephone system. The master panel shall be located in Flight Ops.

6.10.4 Calculations-Provide the following:

6.10.4.1 Load calculations and load factors, including allowance for future loads as specified above.

6.10.4.2 Lighting calculations for each type of room; building entrances and all lighted exterior areas.

6.10.4.3 Short circuit calculations per IEEE Standards.

6.10.4.4 Voltage drop calculations per IEEE Standards.

6.10.4.5 Area breakdowns for special electrical and communications requirements.

6.10.5 Military Regulations and Design Manuals-Design and installation shall conform to the latest editions of the references listed below unless otherwise indicated herein: TI 800-01, 1998-Design Criteria, I 809-04-Technical Instructions for the Seismic Design for Buildings, NANP-1110-1-1, 1990-Manual of Standard Procedures for Planning and Design, ETL 1110-3-491, 2001-Sustainable Design for Military Facilities, UFC 1-200-01, 2002-Design; General Building Requirements. UFC 3-600-01, 2003-Design; Fire Protection Engineering for Facilities.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11 Heating, Ventilating, and Air Conditioning

6.11.1 HVAC Design Parameters: The design shall be based on the following parameters:

Project Location: Fort Drum, New York; Latitude: 44° 02' N; Longitude: 75° 46' W; Elevation: 650' above sea level.

Outdoor Design Conditions:

1. Use 90°F DB OA temperature for air-cooled condensers.
2. Prevailing Wind: From Northwest, at 5 knots, in the winter.
3. Use -30°F DB OA temperature for winter conditions.
4. Summer: 83°F DB and 70°F WB

1. No air conditioning is required for the first floor maintenance area, including, Repair part storage, Avionics room, Comsec storage, Hydraulics room, Electrical shop, Sheet metal shop, Prop and rotor shop, CH-47 repair shop, UH-60 repair shop, Engine shop, Arms storage vault, Armament dirty and armament clean storage, Tool room, and the Bench stock room. For the second floor areas, and the separate sleeping quarters, the heating design condition is 68 Degrees F and the cooling design condition is 75 Degrees F.

6.11.2 HVAC Systems:

6.11.2.1 HVAC System for Communications Room: All Communications Rooms shall utilize an HVAC system which conforms to the requirements of I3A as a minimum. Units shall include air-conditioning, heating, and be independently thermostatically controlled. Units shall be available to provide cooling 365 days per year regardless of outdoor air temperature. Units shall be provided with micro-processor controls and any other options necessary to meet the design conditions such as low ambient temperature controls, humidifiers, or hot-gas bypass reheat for humidity control. Rooms shall be provided with positive atmospheric pressure.

6.11.2.2 HVAC System for Mechanical rooms: To prevent freeze-ups in the mechanical rooms the Contractor shall consider one of the following options:

1. Each gas fired piece of equipment located in the mechanical room shall have a dedicated combustion air louver sized for the combustion air requirements of that unit. An independently controlled combustion air damper shall be provided at each louver and will open whenever the unit is operating. A pre-heat coil shall be installed at each louver to temper the outside air to minimum of 40 degrees F.

2.

2. If a pre-heat coil is not provided to temper the outside air, then all items located in the mechanical room that have a potential of freezing (i.e. water piping including sprinkler piping, water heaters, etc.) shall be located in a separate room and all combustion air requirements shall be direct vented to the outside from the equipment. No outside combustion air intakes louvers shall be provided.

6.11.2.2 Heating System:

The existing hot water heating system includes five (5) cast iron type hot water boilers and circulation pumps. Heating system utilizes a primary/secondary pumping arrangement. The controls activate the lead/lag pumps daily and to equalize their running hours (adjustable).

6.11.2.3 Equipment - The boiler room shall be provided with natural gas and carbon monoxide gas leakage monitoring, with remote alarm. System shall be connected to the DDC system and fire alarm panel. Boilers shall be mounted on anchored, reinforced 4 inch high concrete housekeeping pads, with a 6 inch clear space from boiler to the edge of pad.

6.11.2.4 Gas Piping: Natural gas will be provided from the Fort Drum 15 psig natural gas distribution system. Existing gas pressure in main line at street shall be assumed to be 10 psig for pipes sizing purposes. Provide gas meter to have volume monitored by UMCS. Gas meter assembly shall not be located near outdoor air intakes. Gas meter shall be protected by three 8" diameter bollards and 16-gauge painted galvanized steel shield located 36" above meter supported at the wall and protected by bollards to protect meter from falling snow/ice from roof. Gas valves shall be solenoid valves - "normally open," no manual reset. Transition from underground to above ground piping shall be by anode-less riser.

6.11.2.5 Cooling System: Where chilled water is used for cooling, the chilled water system shall have an air cooled chiller(s) and all required accessories. Pumps shall be base-mounted and selected for non-overloading operation at all conditions. Pump seals shall be silicon carbide for use in systems with suspended particles. If the motors for the distribution pumps exceed 7.0 kW then a primary/secondary pumping arrangement shall be used, the distribution loop shall be designed for variable flow and the pumps shall be controlled by variable frequency drives.

Chilled water piping system shall be constructed of Type L copper or ASTM A53 SCH 40 black steel with screwed, welded or grooved end fittings.

Refrigerants shall be one of the fluorocarbon gases. Refrigerant shall meet the requirements of ARI 700 as a minimum. Refrigerant Ozone Depletion Potential (ODP) shall not exceed 0.00. Refrigerant R-22 shall not be used. Chiller shall be provided with a complete factory mounted and prewired microprocessor based control system. Controls package shall provide operating controls, monitoring capabilities, programmable setpoints, safety controls, and UMCS interfaces.

Exterior cooling system piping trench shall use Marker Tape and Tracer Wire in trenches.

6.11.2.6 Air Handling Units: Modular Type Air Handling Units shall be double wall configuration, cooling coil -sized to cool the outside air to 55 degrees F in order to dehumidify the outside air; filters; and mixing box complete with automatic air dampers. Ultraviolet light C band (UV-C) emitters shall be incorporated downstream of all cooling coils and above all drain pans to control airborne and surface microbial growth and transfer. Safety features shall be provided to prevent hazard to operating staff. Units shall not produce ozone. Freeze protection shall be accomplished by monitoring the air handling units discharge air temperature. When the discharge air temperature falls to 50 degrees F (adjustable), the DDC system shall send a signal to stop fan, close the outside air damper, and send an alarm to the control system. Filters shall have a MERV of 8 or higher when evaluated under ASHRAE standard 52.2. All filters shall be

UL class 2. Provide each filter assembly with its dedicated automatic alarm (latching) to signal the need for filter change due to loading.

6.11.2.6.2 The air handling units shall be provided with high efficiency motors, with adjustable sheaves and electronic, direct digital type automatic temperature controls, to facilitate operation in the "occupied/unoccupied" modes of operation. Units shall be provided with a discharge duct smoke detector.

6.11.2.6.1 Gas-fired, make-up air handling units shall be sized for 100% outside air, galvanized steel construction, with forward curved, belt drive, centrifugal fan, vibration isolators; sized to heat outside air to 68° F.

6.11.2.7 Ventilation and Exhaust Openings: Outside air shall be taken through outdoor air louver with louvers to be "double rain guard type". Ducts at louvers shall be watertight for 8'-0" from louver and shall pitch to drain to louver or attached 2" diameter minimum size drain with trap piped to floor drain.

6.11.2.8 Freeze Protection: All chilled water and hot water piping shall be protected from freezing by use of a 40% propylene glycol/60% water mixture. Glycol mixture shall be premixed by manufacturer using deionized water. Contractor shall provide glycol fill station for each separate heating and cooling system with feed water pump, tank, all necessary water treatment equipment, required hydronic controls and accessories for all hydronic systems. Glycol fill station shall be automatically operated, manually filled, with a minimum volume of 50 gallons. Provide test kits and a test coupon assembly with balancing valve, shut-off valve and plugged tees for sampling connections, 1-inch diameter. Provide drum-mounted, manually operated bung pump for the transfer of glycol into the storage and make-up/fill tank. The glycol make-up system shall automatically operate on a reduction of system pressure. Fluid level in the glycol tank shall be monitored by the DDC system and shall send an alarm when the fluid level is low. Domestic water connection shall not be provided.

6.11.2.9 Boilers. Boilers shall provide heating for the buildings and shall be cast iron, gas-fired boilers with minimum annual fuel utilization efficiency (AFUE) of 88%. (Basis of design: Hydrotherm KN Series.) Pulse type combustion boilers are not acceptable. (Note: Fort Drum requires cast iron condensing boilers due to their smaller footprint and higher efficiency.) Provide minimum of two boilers. Each boiler's capacity shall be 65% of the calculated capacity required to heat building. Manufacturer's packaged operation controls shall be provided to handle all aspects of capacity modulation and safeguarding. Controls shall be provided to allow for staggered operation and shall interface with the building DDC system and allow changes to be made to boiler control set points from the DDC system. Boiler water supply temperature shall be reset based on outside air temperature controlled by DDC control system. Solid-state controls shall be used to monitor and control all operating and safety functions. Each boiler shall utilize a separate boiler secondary pumping system to maintain constant hot water (glycol) circulation rate through the boiler whenever the boiler is enabled. Burners shall be power burners. Boiler flue system shall be a double wall, prefabricated, positive pressure type, stainless steel and factory pre-insulated, furnished and installed in strict accordance with

manufacturer's installation requirements. Boiler vents exiting through the roof shall be not more than 5'-0" from the roof ridge. Anchor at 2 points within the building.

6.11.3 Controls:

HVAC system temperature control system shall be a microprocessor based Direct Digital Control (DDC) system. The DDC system shall completely, seamlessly and directly interfaces with the existing base-wide Utility Management and Control System (UMCS) installed at Fort Drum without interpreters or third party devices. Communication with existing base-wide Utility Management and Control System (UMCS) workstations, servers and laptops shall utilize BACnet protocol and be configured for operation on VLAN#4003 only, connected by common fiber optic system serving building. The system shall include software with all the necessary means for global data exchange, scheduling, local and remote control and adjustment; load shedding for demand control; event management; monitoring; trending; logging; maintenance notification; and alarms. The Fort Drum systems are Trane, Siemens. The building control systems must have seamless communications with one of the two existing base-wide systems and be capable of sending to, receiving from, and interpreting global commands with the base-wide system and resident software.

In addition to fully control and monitor the building HVAC systems, the DDC system shall monitor the following:

1. Water meters.
2. Gas meters.
3. Building electrical power and demand meter.
4. Glycol fill tank fluid level.
5. Natural gas detector.
6. Carbon monoxide detectors.
7. Existing global system substations electrical power and demand meters.
8. Existing global system outside air temperature.
9. Existing global system duty cycling modes for demand shedding.
10. Existing global system summer/winter modes.
11. Existing global system heating/cool modes.
12. Control exterior lighting through a "Hand-Off-Auto" switch.
13. Building fire alarm system.

14. Freezestat points.
15. Low ambient temperature control.
16. Oil/water separator's oil chamber level
17. Humidity control

6.11.4 HVAC Systems Building-Specific Design Requirements:

6.11.4.1 HVAC Systems: General-All facilities shall be equipped with HVAC systems that are appropriate for their function and occupancy and meets all code requirements. Systems shall be designed and installed in accordance with the latest industry standards for each type of application.

6.11.4.2 Maintenance Shops and Offices-Maintenance shop areas shall be heated by using a floor radiant heat system in accordance with UFC 3-410-01. The radiant heat system shall be sized to provide a minimum of 50% of the heat load for the spaces. The in-floor radiant heat system shall be the hydronic type.

6.11.4.2.1 Air handling units shall be located in attic spaces or exposed, suspended from the structure depending on the size and arrangement of the building. Air handling units shall provide the remainder of the heat load and ventilation required. Air handling units shall be designed to provide minimum outdoor air during normal operation with the capability of providing 100% outdoor air when outdoor air can be used for free cooling. CO2 detector in return steam will modulate outdoor air open as necessary to maintain code-compliant CO2 levels in the building. Where cooling is required, cooling shall be made available to each room year-round through the use of mechanical cooling or the use of outdoor air for free cooling.

6.11.4.2.2 The Welding area shall have a separate exhaust system, rated for the temperature and particulate produced by welding, including but not limited to exhaust fan, ductwork, hangers and supports to remove smoke generated during welding.

6.11.4.2.3 Provide dehumidifier for Weapons vault room.

6.11.4.3 Testing Adjusting and Balancing (TAB)-TAB shall be performed in accordance with AABC, TAB, or NEBB procedures by a certified TAB specialist. The TAB specialist shall review the contract plans and specifications and provide a written report advising the Contracting Officer of any deficiencies found that would prevent the system from operating as designed. The TAB report shall include a copy of appropriate schematic drawings, pump and fan curves for each system. The TAB specialist shall recheck 10% of the measurements listed in the TAB report. Location shall be chosen and witnessed by the Contracting Officer. Damper and balancing valve settings shall be permanently marked. All test ports shall be plugged. The TAB report shall be plus 10% or more and minus 10% of design.

6.11.4.3.1 The TAB subcontractor shall be financially and corporately independent of the mechanical, electrical, and commissioning subcontractor(s), as well as the Design-Build Contractor.

6.11.4.4 Vibration and Noise Isolation- All piping, ductwork, heating and ventilating units and equipment shall be properly isolated to prevent vibration and subsequent noise limited to 10%

transmission of the lowest equipment RPM. All piping within 50; of rotating equipment shall be vibration isolated with combination steel spring and neoprene hangers or floor mounts with suitable seismic restraints.. All rotating equipment shall be vibration isolated with combination steel spring and neoprene hangers on floor mounts with suitable seismic restraints. Isolator deflections shall be as per ASHRAE Application Handbook.

6.11.4.5 Commissioning of Systems-The Contractor shall designate team members to participate in pre-commissioning and commissioning of systems. The Contractor shall perform all commissioning in accordance with requirements outlined in "ASHRAE Guideline 1-Commissioning of HVAC Systems".

6.11.4.5.1 Functional performance (commissioning) test shall be performed after all pre-commissioning deficiencies have been corrected. Functional performance tests shall prove all modes of the sequence of operation.

6.11.3.1 Instruction: Upon completion of work and acceptance by Government, factory representatives under direct employ of temperature control manufacturer shall provide 8 hours of classroom and "hands-on" instruction to 20 of Government's operating personnel responsible for mechanical systems. Instruction shall be video recorded and three copies provided on DVDs.

Integrate the control system to the installation's existing UMCS. The existing UMCS is [Not Supplied - PS_HVAC : UMCS_DESCRIPTION]

6.12. ENERGY CONSERVATION

6.12.1. General

6.12 Energy Conservation

Refer to paragraph 6.14 Sustainable Design

Need to add renewable energy features

6.12.2. Inclusion of Renewable Energy Features. The following renewable energy features have been determined lifecycle cost effective, are included in the project budget and shall be provided:

[Not Supplied - PS_EnergyConservation : RENEWABLE_ENERGY_FEATURES]

6.13. FIRE PROTECTION

6.13 Fire Protection

6.13 Fire Protection:

6.13.1 Standard Design:

6.13.1.1 Fire Protection Engineer-The Contractor shall provide the services of a qualified fire protection engineer. The fire protection engineer shall be an integral part of the design team and shall be involved in all aspects of the design of the fire protection system. As a minimum, the fire protection engineer shall design the automatic sprinkler systems; the fire alarm system; and the Monaco fire alarm radio transmitter/receiver system.

6.13.1.2 Fire Protection and Life Safety Analysis-The fire protection engineer shall perform a fire protection and life safety analysis of the proposed facility.

6.13.1.3 Water Supply-The Contractor must perform a detailed water analysis of the site. The Contractor, in the immediate vicinity of the proposed site plan, shall conduct multiple fire hydrant flow testing. The flow tests shall be coordinated with the Fort Drum Fire Chief and the Fort Drum DPW. The Contractor shall utilize their flow test data and hydraulic analysis as the basis of the water supply design.

6.13.1.4 Incoming Fire Service Main-Extend the existing fire protection system or provide a new, minimum 8" fire service, for the building, which the domestic water service shall be branched off of and be supplied by it. A post indicator valve (PIV) shall be provided outside at a minimum distance of 50' from the exterior of the building. The incoming fire protection system shall be in the mechanical room and shall be located to prevent freezing. A backflow preventer shall be provided with OS&Y valves at each end to isolate the assembly.

6.13.1.5 Sprinklers-Sprinklers with internal O-rings shall not be used. Sprinklers shall be quick response (QR) unless otherwise indicated. All areas without a finished ceiling shall be provided with upright sprinkler heads.

6.13.1.6 Fire Extinguisher Cabinets- Extinguisher shall be installed in semi-recessed cabinets. Cabinets shall be non-locking type with glass window.

6.13.1.7 Piping-There shall be no exposed sprinkler piping in the building except in the mechanical and electrical spaces, stairwells and the hangar areas.

6.13.1.8 Fire Department Connection-Threads shall be 5" Storz connection compatible with the equipment at the Fort Drum Fire Department. It shall be installed with a 45° downturn. At this termination the riser is to be protected with a painted, concrete-filled, steel bollard. FDC escutcheons shall be lettered to identify the interior building fire protection system(s) as appropriate, either as "AUTO SPKR" or "AUTO SPKR & STANDPIPE". The location of the Fire Department connection shall be coordinated and approved by the Fort Drum Fire Chief. The location of the Fire Department connection may not necessarily be in the vicinity of the incoming fire service but, shall be within 150' of a fire hydrant.

6.13.2 Fire Alarm/Mass Notification System-All materials, equipment, fixtures and appurtenances shall be labeled by Underwriters Laboratories, Inc. or a similar organization acceptable to the Government.

6.13.2.1 Fire Alarm and Detection System:

6.13.2.1.1 The hangar facility currently uses an addressable Notifier fire alarm control panel. The fire alarm control panel communicates using a Monaco BT-28 transmitter. The BT-28 transmitter shall be replaced with a Monaco BTX to allow the mass notification system (described in Section-6: Electrical). The remainder of the alarm and notification devices in the hangar bay area shall remain unchanged.

6.13.2.1.2 The existing fire alarm shall be expanded to include alarm and detection devices in the addition. Fire alarm and detection systems shall be complete, addressable, microprocessor-based, self-interrogating type, provided and installed in accordance with the codes and standards referenced above. Peripheral devices shall choose to operate on the existing Notifier control panel. Systems and all associated peripheral devices shall be UL-listed.

6.13.2.1.3 Systems shall be programmed such that actual sequence of operation complies with the requirements for system inputs and outputs as defined by the typical fire alarm system I/O Matrix found in NFPA 72.

6.13.2.1.4 All fire alarm and detection circuits shall be run in dedicated EMT conduit with a minimum size of $\frac{3}{4}$ ".

6.13.2.1.5 All fire alarm raceway and components shall be mounted to meet all necessary seismic restraint requirements.

6.13.2.1.6 The NAC (Notification Appliance Circuits) and the SLC (Signal Line Circuits) shall be class and style as required for the application. The AID (Alarm Indicating Device) circuits shall be Style "D" (Class "A"). All circuits shall have at least 40% spare capacity for additional devices (initiating and indicating) in each building.

6.13.2.1.7 All Class A circuits shall be installed such that the outgoing and returning conductors exiting from and returning to the Fire Alarm Control Panel (FACP), respectively, are routed in separate, dedicated conduit. Outgoing and returning conductors shall not be run in the same cable assembly, enclosure, or raceway.

6.13.2.1.8 Adequate separation between outgoing and return conductors shall be provided to ensure protection of conductors from physical damage. Recommended minimum separation to prevent physical damage shall be 1'-0" where installed vertically, or 4'-0" where installed horizontally.

6.13.2.1.9 The FACP is provided with dedicated branch circuit supplying primary power and a dedicated secondary (back-up) power source, in accordance with the requirements of NFPA 72.

6.13.2.1.10 All fire alarm system control equipment and circuits shall be provided with transient voltage surge suppression per the requirements of NEC.

6.13.2.1.11 At the entrance of Building 4020, a remote Fire Alarm Annunciator Panel (FAAP), capable of the same control functions of the FACP, shall be provided for firefighter's use.

6.13.2.1.12 The system shall be capable of providing positive alarm sequencing, pre-signal function, alarm verification, and cross-zoning of detectors.

6.13.2.1.13 The system shall be compatible with, and interface to, other life safety systems installed within the facility including, but not limited to, Fire Protection System, Building Automation System, and Mass Notification System.

6.13.2.1.14 The FACP shall be provided with remote, dial-up access for programming and trouble shooting.

6.13.2.2 Fire Alarm Transmission:

6.13.2.2.1 The existing FACP communicates with a Monaco BT-28 transceiver. Replace the existing Monaco BT-28 transceiver with a Monaco BTX transceiver as stated below.

6.13.2.2.2 Interface the FACP with the Monaco BTX radio frequency transceiver providing 60 zones for transmission of signals to the existing base-wide Monaco D-21 radio fire alarm monitoring system. Monaco BTX transceiver shall utilize Monaco FSK protocol and transmit at 413.3250 MHz. All fire detection system alarm, trouble, and supervisory conditions shall be transmitted as separate signals to the base fire monitoring system. Coordinate signal transmission with the Fire Department Fire Prevention Officer. Monaco BTX transceiver shall also support mass notification for the facility (pre-recorded tones and messages, and "live-voice" line-level audio). Monaco BTX radio frequency transceiver and all related equipment shall be FM-approved.

6.13.2.2.3 Monaco BTX radio frequency transceiver shall provide a total of 60 identification zones to support alarm signal transmission as appropriate for the size of facility and occupancy types where installed, while providing a minimum capacity of 25% for future system expansion. Coordinate required number of identification zones for current scope of work with the Fire Department Fire Prevention Officer.

6.13.2.2.4 Monaco BTX radio frequency transceiver shall be provided with back-up batteries capable of operating the unit for a minimum of 24 hours under supervisory condition, and at the end of that period shall be capable of operating the unit under full alarm condition for an additional 5 minutes.

6.13.2.2.5 Monaco BTX radio frequency transceiver shall be connected to the Omni-directional type antenna for low loss coaxial cable.

6.13.2.2.6 Monitor Module shall be designed to monitor system components that are not equipped for multiplex communication with the fire alarm control panel and cannot transmit a unique identification signal. Monitor Modules shall be provided in the appropriate quantity and location (no greater than 3 feet away) to individually monitor other fire alarm initiating devices or supervisory devices and provide a unique address to the fire alarm control panel. The monitor module shall contain an integral LED that flashes each time the control module is polled.

6.13.2.2.7 Control Modules shall be capable of operating as a relay (dry contact FORM C) for interfacing the control panel with other systems or other devices. The module shall be UL Listed as compatible with the control panel. The indicating device or the external load being controlled shall be configured as a STYLE Y notification appliance circuit(s). The system shall be capable of supervising audible, visual and dry contact circuits. The supervision shall detect a short on the supervised circuit and shall prevent power from being applied to the circuit. The control

module shall contain an integral LED that flashes each time the control module is polled and be located within 3 feet of the controlled circuit or appliance.

6.13.2.3 Fire Alarm Detector Coverage:

6.13.2.3.1 This coverage refers to the fire alarm device installation in the hangar addition.

6.13.2.3.2 In fully sprinklered facilities, partial coverage shall be provided per the requirements of NFPA 72. Detection devices shall be provided in all common areas and work spaces, such as corridors, lobbies, storage rooms, equipment rooms, and other tenantless spaces with detector operation in accordance with the ambient environment found in those spaces.

6.13.2.4 Fire Alarm Peripheral Devices-The FACP shall support peripheral fire alarm and detection devices including, but not limited to, the following:

6.13.2.5 Addressable Manual Pull Stations-Manual pull stations shall be double action, of aluminum construction, and shall be located and spaced in accordance with the requirements of NFPA 72. All manual pull stations shall be provided with clear, polycarbonate, protective covers.

6.13.2.5.1 Addressable manual pull stations shall be located within 5'-0" of the exit doorway opening at each exit on each floor.

6.13.2.5.2 Addressable manual pull stations shall be located on both sides of grouped openings over 40'-0" in width, and within 5'-0" of each side of the opening.

6.13.2.5.3 Additional addressable manual pull stations shall be provided so that the travel distance to the nearest device will not exceed 200'-0", measured horizontally on the same floor.

6.13.2.6 Addressable Smoke Sensors-Smoke sensors shall be the photoelectric type for the detection of slow, smoldering fires, and ionization type for the detection of rapidly spreading, flaming fires. Location and spacing of smoke sensors shall be in accordance with NFPA 72 for the specific ceiling height and type of ceiling construction in the area installed. A spacing of 30'-0" on center shall be permitted to be used as a guide.

6.13.2.6.1 Addressable smoke sensors shall be located on the ceiling not less than 4" from a sidewall to the near edge of the device, or if on a sidewall, between 4" and 12" down from the ceiling to the top of the detector.

6.13.2.7 Addressable Heat Sensors-Heat sensors shall be self-restoring, combination fixed-temperature and rate-of-rise type, with the location and spacing of heat sensors in accordance with NFPA 72 for the specific ceiling height and type of ceiling construction in the areas installed. A spacing of 50'-0" on center shall be permitted to be used as a guide.

6.13.2.7.1 Addressable heat sensors shall be located on the ceiling not less than 4" from a sidewall to the near edge of the device, or, if on a sidewall, between 4" and 12" down from the ceiling to the top of the detector.

6.13.2.8 Addressable Duct Detectors-Duct detection units shall consist of a housing with an integral photoelectric smoke sensor, a sampling tube of appropriate length, a UL-listed fire alarm relay, and a remote test station where required in accordance with NFPA 72. Duct detectors

shall be provided in the supply and return side of all air handling units, based upon each unit's air flow rates as measured in cfm, per the requirements of both NFPA 90A and the International Mechanical Code.

6.13.2.9 Addressable Monitor Modules-Individual addressable modules shall be provided to monitor trouble and alarm conditions for the following devices:

6.13.2.9.1 Sprinkler system flow and tamper switches, post indicating valves, and OS&Y connections.

6.13.2.9.2 Conventional, hard-wired, high-temperature heat detectors.

6.13.2.9.3 Fire pumps, if required, in accordance with NFPA 20.

6.13.2.9.4 Exhaust hoods or rolling fire shutters with fusible links.

6.13.2.9.5 Combustible gas detectors and carbon monoxide detectors.

6.13.2.9.6 Individual addressable modules shall be located 3'-0" from the device being monitored, where possible.

6.13.2.10 Addressable Control Modules:

6.13.2.10.1 Individual addressable modules shall be utilized to control outputs, in conjunction with a UL-listed fire alarm relay, in response to specific fire alarm system inputs. The device or circuit being controlled shall be configured as a Class B, Style Y circuit.

6.13.2.10.2 Shut-down of HVAC units and any associated smoke/fire dampers.

6.13.2.10.3 Shut-down of boilers and all other gas-operated appliances via solenoid valves at the individual appliance, upon alarm for gas detection device in the associated mechanical space.

6.13.2.10.4 Closing mechanically controlled rolling fire shutters.

6.13.2.10.5 Closing electromagnetically held doors located in corridors and lobbies of administrative areas.

6.13.2.10.6 The UL-listed fire alarm relay connected to the addressable module and used to initiate control of life safety functions, as noted above, shall be located with 3'-0" of the device or circuit being controlled.

6.13.2.11 Notification Appliances:

6.13.2.11.1 Fire alarm strobes and combination speaker/strobes shall be provided in accordance with the requirements for audible and visible characteristics of devices installed in facilities identified as falling within the public operating mode, with spacing and location of devices per NFPA 72.

6.13.2.11.2 Audible notification devices shall have a sound level of not less than 45dBA at 10'-0" or more than 120 dBA at the minimum hearing distance from the audible device.

6.13.2.11.3 Audible signals shall have a sound level at least 10dB above the average ambient sound level or 5dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5'-0" above the floor in the occupied area.

6.13.2.11.4 Weatherproof speakers/strobes shall be provided on the facility's exterior, with spacing and location of devices per NFPA 72.

6.13.2.11.5 All fire alarm strobes shall flash in synchronization, with light pulse characteristics and candela ratings in accordance with the requirements of NFPA 72.

6.13.2.11.6 Visible notification appliances shall be located not more than 15'-0" from the end of a corridor, with a separation not greater than 100'-0" between appliances. If there is an interruption of the concentrated viewing path, by any obstruction, that area shall be treated as a separate corridor.

6.13.2.11.7 Notification appliances shall support selective signal silencing (speakers sound until silenced, strobes flash until panel is reset). Fire alarm and detection system notification appliances shall be a common device, shared with the mass notification system, with device having two strobes, white for fire alarm and amber for mass notification. Speaker/strobes shall produce an audible alarm tone for the fire detection and alarm system that is distinctive and clearly recognizable from the alarm tone associated with the mass notification system. The alarm tone associated with the fire alarm system shall take priority over the tone associated with the mass notification system, even when the mass notification system is initiated prior to the fire alarm system.

6.13.2.11.8 Mounting heights for all peripheral fire alarm and detection system devices shall be in accordance with the requirements of NFPA 72.

6.13.3 Gas Detection:

6.13.3.1 Combustible gas detectors (calibrated to alarm at 25% of the LEL of methane), and carbon monoxide detectors (calibrated to alarm at 35 ppm) shall be installed in all mechanical rooms. Each combustible gas and carbon monoxide detector shall be provided with a dedicated horn/strobe unit located in close proximity, having an amber lens and providing a distinctive audible alarm tone clearly recognizable from audible alarm tones associated with the fire alarm and mass notification systems. Activation of these detectors shall initiate a building general fire alarm, but will not activate strobes or speaker/strobes associated with the fire alarm and mass notification systems.

6.13.3.2 Strobes associated with gas detectors shall flash in synchronization with strobes provided in conjunction with the fire alarm and mass notification systems. Light pulse characteristics and candela ratings of these devices shall be in accordance with the requirements of NFPA 72.

6.13.3.3 Signage provided with gas detection horn/strobes shall clearly identify hazardous condition present, and accurately depict immediate evacuation route to fresh air from the affected area.

6.13.4 Testing/Training:

6.13.4.1 Upon completion of the installation, all fire protection systems shall be subjected to functional and operational performance tests. These tests shall be witnessed by the Authority Having Jurisdiction (AHJ), and the Owner or the Owner's Representative. The Contractor shall notify the above witnesses, in writing, 72 hours prior to the commencement of testing. Failure to contact the above parties, as described, will require the Contractor to conduct tests a second time at the Contractor's expense in the presence of the above parties.

6.13.4.2 The Contractor shall provide the on-site services of an authorized technical representative of all manufacturers deemed necessary by the Owner, Owner's Representative or AHJ. Technical representatives shall supervise and assist in fully testing all components of the fire protection systems installed as directed by the Owner's Representative. The Contractor shall provide the services of the installation personnel to accompany and take direction from the Owner's Representative while conducting final testing/commissioning of the system. All systems shall be tested at random to ensure full functionality.

6.13.4.3 All testing shall be conducted in accordance with all applicable codes and standards for testing and commissioning of fire protection systems. Copies of all testing paperwork generated and any additional testing/commissioning paperwork deemed necessary by the Owner, Owner's Representative, and AHJ shall be provided to them at the completion of the testing.

6.13.4.4 The Contractor shall provide a minimum of 4 hours of instruction, operation, and maintenance of all elements of the materials and methods utilized for the installation of all fire protection systems and features. Training shall be scheduled on two different days, one odd and one even, to accommodate both shifts of the Fort Drum firefighters. Training shall be for "non-technician" personnel prior to the commissioning of the of the building fire suppression system. All training shall take place prior to the final acceptance testing of the system. All demonstration and training provided to Owner personnel shall be witnessed by the Owner's Representative and the AHJ. The Contractor shall notify the above witnesses, in writing, 72 hours prior to the commencement of testing. Failure to contact the above parties will require the Contractor to conduct training a second time, at the Contractor's expense, in the presence of the above parties.

6.13.4.5 Instruction shall be provided by a material or system manufacturer's certified representative familiar with the equipment and special operating requirements of the system provided and the Owner's operating procedures.

6.13.4.6 Instructions shall include classroom training as well as hands-on training of all components of the system and their operation.

6.13.4.7 Instruction shall be made available on a schedule acceptable to the Owner and the availability of the operating personnel. Instructions shall be in two separate groupings with the last instruction time frame 30 days after the second grouping. This is to allow the operating personnel to familiarize themselves with the equipment and get follow-up training as required. The last training session shall be a minimum of 2 hours.

6.13.4.8 The Contractor shall be responsible for providing sufficient training materials for all present at the training session (minimum 15 personnel). Coordinate actual requirements with the Owner at the time of the training.

6.13.4.9 The Contractor shall be responsible for providing video-taped training sessions, which will be submitted to the Owner for future employee training. All of the training sessions conducted will be video-taped.

6.13.4.10 Include NFPA-70 fire symbols standard as a reference document.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 2.2.

6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: [Not Supplied - PS_SustainableDesignGeneral : SD_EXEMPT_FACILITIES].

6.14.3. Credit Validation: LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required. Registration and payment of registration fees will be by the Government. Administration/team management of the online project will be by the Government. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is not required. The Government may choose to seek LEED certification of the project, in which case the Government will pay certification fees and coordinate with the GBCI and the Contractor will furnish audit data as requested at no additional cost.

6.14.4. Commissioning: See Appendix M for Owner's Project Requirements document(s).

6.14.5. LEED Credits Coordination. The following information is provided relative to Sustainable Sites and other credits.

SS Credit 1 Site Selection:

Project site IS NOT considered prime farmland.

Delineation of 100-year flood elevation is shown on site drawings provided in this CONTRACT.

Delineation of threatened or endangered species habitat is shown on site drawings provided in this CONTRACT.

Delineation of water, wetlands and areas of special concern is shown on site drawings provided in this CONTRACT.

Project site WAS NOT previously used as public parkland.

SS Credit 2 Development Density & Community Connectivity.

Project site DOES NOT meets the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meets the criteria for this credit.

SS Credit 4.1 Public Transportation Access.

Project site DOES NOT meets the criteria for this credit.

EA Credit 6 Green Power.

35% of the project's electricity WILL NOT will be provided through an Installation renewable energy contract. Do not purchase Renewable Energy Credits (REC's) to earn this credit.

MR Credit 2 Construction Waste Management.

The Installation does not have an on-post recycling facility available for Contractor's use.

6.14.6. LEED Credit Preferences, Guidance and Resources. See Appendix L LEED Project Credit Guidance for supplemental information relating to individual credits.

6.14.7. Not Used

6.14.8. Additional Information

6.14.8 Enhanced Commissioning: Enhance commissioning is required for this project.

6.15. ENVIRONMENTAL

6.15 Environmental

6.15.1 ENDANGERED SPECIES

(1). The federally endangered Indiana bat is present on Fort Drum and must be considered in all actions. Actions on Fort Drum, must be in accordance with requirements negotiated with the U.S. Fish & Wildlife Service under Section 7 of the Endangered Species Act. Projects involving ANY habitat modification (e.g., vegetation removal) must be addressed by Fort Drum's Fish and Wildlife Management Program. In general, no trees greater than 4 inches (diameter breast height) may be cut from 15 April - 01 October to avoid any direct adverse effects to the Indiana bat. Clearing of natural vegetation (e.g., shrubs and trees) less than 4 inches (diameter breast height) should typically occur between August 1 - April 15 to minimize the impact to migratory birds and to maintain foraging areas for bats. The contractor (and all subcontractors) shall be responsible for coordination with Fort Drum's Fish & Wildlife Management Program to ensure compliance with the Endangered Species Act and all other applicable laws and regulations pertaining to wildlife. Overall the contractor (and all subcontractors) shall minimize interference with, disturbance to, and damage to plants, fish, wildlife, and their habitats on and adjacent to the project area. The contractor shall immediately inform the COR of any coordination or contact with Fort Drum/s Fish and Wildlife Management Program.

(2). Flagging or signs must be used to demarcate areas to be cleared vs. not cleared prior to any construction activities or tree clearing for a given project. Clearing must only occur within the flagged area, and flagging must be removed upon completion of the project.

(3). If any bats are discovered during the demolition or repair of buildings (to include work such as complete and partial building demo, removal/replacement of roofs, siding, etc.), all work must cease and Fort Drum's Fish and Wildlife Management Program (772-9636 or 772-4999) must be immediately contacted. If the building has pre-existing known bat colonies, then Fort Drum's Fish and Wildlife Management Program must be contacted before demolition is to occur. (At this time, the only structures known to contain bat colonies are within the historic LeRay Area.).

(4). All found bats must be immediately reported to Fort Drum's Fish and Wildlife Management Program (772-9636 or 772-4999). Do not attempt to handle any live bats, regardless of condition. If a live bat is found in a building please contact 772-2072 or 772-4999.

(5). Light minimization measures are to be incorporated for all exterior lighting that may include but are not limited to full cutoffs, reflectors, shields, and/or downward angling of lights. The following are guidelines that have been established for light minimization within the draft Installation Design Guide and must be followed to the maximum extent possible.

a. Maximum light at the edge of parking lot/road pavement will be 2 foot candles or its equivalent.

b. Light levels for parking lots/sidewalks shall be in accordance with Illuminating Engineering Society (IES) Lighting Handbook.

c. A Professional Engineer must review the lighting plan and ensure it is sound and meets minimization requirements.

d. Use full cutoff luminaires for road, parking lot, and sidewalk illumination. These are luminaires that allow no direct light emissions above a horizontal plane through the luminaire's lowest light emitting part.

e. Use downward-angling lights and appropriate shields in all applicable locations.

(6). No night lighting for construction projects is authorized without prior coordination and authorization from the COR and Fort Drum's Fish and Wildlife Management Program.

(7). Project planning and design should attempt to minimize building footprints by combining infrastructure (i.e. roads, utility lines, etc.) for multiple buildings or by constructing multi-story versus multiple or expanded single story buildings whenever possible.

1.11 OUTDOOR LIGHTING MINIMIZATION

The purpose of the Fort Drum Outdoor Lighting Guidelines is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. These Guidelines will ensure appropriate outdoor lighting in compliance with the Endangered Species Act and in accordance with the Fort Drum's Army Strategic Plan for Sustainability.

Definitions

- a. **Fixture Height:** height of the fixture shall be the vertical distance from the ground directly below the centerline of the fixture to the lowest direct light emitting part of the fixture.

- b. **Foot-candles:** a unit of illumination of a surface that is equal to one lumen per square foot. For the purposes of these regulations, foot-candles shall be measured at a height of 3 ft. above finished grade.

- c. **Fully Shielded Light:** light fixtures shielded or constructed so that no light rays are directly emitted by the installed fixture at angles above the horizontal plane as certified by a photometric test report. The fixture must also be properly installed to effectively down direct light in order to conform with the definition.

- d. **Light Trespass:** the shining of light produced by a light fixture beyond the boundaries of the property on which it is located.

- e. **Lumen:** the unit of luminous flux, the total amount of light falling uniformly on or passing through an area of 1 square foot, each of which is 1 foot from a 1-candela source, yielding an illuminance of 1 foot candle at that distance (the output of lamps and bulbs is customarily measured in lumens, a common 100 watt incandescent light bulb, for example, having an output less than 1,800 lumens).

- f. **Point Light Source:** the exact place from which illumination is produced (i.e., a light bulb filament or discharge capsule).

- g. **Sag-lens or Drop-lens:** A clear or prismatic refracting lens that extends below the lowest opaque portion of a light fixture.

Applicability

All outdoor lighting fixtures installed, retro-fitted, or replaced on Fort Drum property shall comply with these regulations. These regulations do not apply to interior lighting.

Exemptions

The following are exempt from the provisions of these guidelines:

- a. Traffic control signals and devices.
- b. Temporary emergency lighting (i.e. fire, police, repair workers).
- c. Moving vehicle lights.
- d. Navigation lights (i.e. airports, heliports, radio/television towers).
- e. Seasonal decorations with individual lights in place no longer than 60 days.
- f. Lighting for flags. Efforts should be made in these areas to minimize sky glow and light trespass whenever feasible.
- g. Sports field outdoor lighting (i.e. ball fields, football, soccer, ice rink, etc.). Sports outdoor lighting is to be turned off when a sporting event is not occurring.
- h. Other special situations for temporary or periodic events (i.e. fairs, festivals, carnivals, night-time construction).
- i. Security lights of any wattage that are controlled by a motion-sensor switch and which do not remain on longer than 10 minutes after activation.

j. Access points, Army Supply points, or other high security areas subject to AR 190-11 or TM-8-583-2. Efforts should be made in these areas to minimize sky glow and light trespass whenever feasible.

Additional exemptions may be provided after coordination with Fort Drum's Fish and Wildlife Management Program.

General Standards

The following general standards shall apply to all outdoor lighting installed, retrofitted, or replaced on Fort Drum, which is not exempted above:

- a. Outdoor lighting must be hooded, fully shielded (i.e. full cutoff fixtures), and/or aimed downward. Outdoor lighting used to illuminate parking spaces, driveways, maneuvering areas, or buildings shall conform to the definition for "fully shielded light fixtures" and be designed, arranged and screened so that the point light source shall not be visible from adjoining lots (i.e. woodlands) or streets.
- b. The intensity of light within a site shall not exceed two (2) footcandles at any property line, edge of pavement, or road.
- c. The hood or shield must mask the direct horizontal surface of the light source. The light must be aimed to insure that the illumination is only pointing downward onto the ground surface, with no escaping light permitted to contribute to sky glow by shining upward into the sky.
- d. Any bright light shining onto adjacent properties (i.e. woodlands) or streets which would result in a nuisance glare or a disabling glare shall not be permitted. Light trespass beyond property boundaries or above the horizontal plane shall be considered non-compliant.
- e. Existing fixtures may be adapted to comply with these guidelines by adding a properly designed hood or shield, or by pointing any upward-mounted, shielded fixture downward onto the ground surface.

- f. All outdoor lighting fixtures shall be designed, installed, located and maintained such that nuisance glare onto adjacent properties (i.e. woodlands) or streets shall be minimized and all direct illumination kept within the boundaries of a building's property.
- g. Accent lighting shall be directed downward onto the building or object and not toward the sky or onto adjacent properties (i.e. woodlands). Direct light emissions shall not be visible above the roof line or beyond the building edge.
- h. Spotlighting on landscaping and foliage shall be limited to 150 watts (2220 lumens output) and lighting is to be angled downwards. The lamp shall be fully shielded and not create disabling or nuisance glare.
- i. No sag-lens or drop-lens are to be used.

6.16. PERMITS

6.16 Permits

N/A

6.17. DEMOLITION

6.17 Demolition

6.17.1 Site Demolition: Contractor to provide demolition, removal and legal disposal (off Fort Drum) of any and all existing man made features that will be impacted by the proposed development.

6.18. ADDITIONAL FACILITIES

6.18 Additional Facilities

N/A

End of Section 01 10 00.[Not Supplied - ProjectInfo : TONUM]

SECTION 01 32 01.00 10
PROJECT SCHEDULE

1.0 GENERAL

1.1. REFERENCES

1.2. QUALIFICATION

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. BASIS FOR PAYMENT AND COST LOADING

3.3. PROJECT SCHEDULE DETAILED REQUIREMENTS

3.4. PROJECT SCHEDULE SUBMISSIONS

3.5. SUBMISSION REQUIREMENTS

3.6. PERIODIC SCHEDULE UPDATE MEETINGS

3.7. REQUESTS FOR TIME EXTENSIONS

3.8. DIRECTED CHANGES

3.9. WEEKLY PROGRESS MEETINGS

3.10. OWNERSHIP OF FLOAT

3.11. TRANSFER OF SCHEDULE DATA INTO RMS/QCS

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

- U.S. ARMY CORPS OF ENGINEERS (USACE) ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems <http://www.usace.army.mil/publications/eng-regs/er1-1-11/entire.pdf>

1.2. QUALIFICATIONS

Designate an authorized representative who shall be responsible for the preparation of the schedule and all required updating (statusing) and preparation of reports. The authorized representative shall be experienced in scheduling projects similar in nature to this project and shall be experienced in the use of the scheduling software that meets the requirements of this specification.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.1.1. Submit a project schedule as specified herein for approval showing the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project, including the design and construction sequences is required. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing an accurate project schedule. The schedule must be a forward planning as well as a project monitoring tool. The approved project schedule shall be used to measure the progress of the work and to aid in evaluating requests for excusable time extensions. The schedule shall be cost loaded and activity coded as specified herein. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule

3.1.2. Status the schedule on at least a monthly basis, as specified herein. If in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained. See paragraph 3.7.4.

3.1.3. Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2. BASIS FOR PAYMENT AND COST LOADING

The schedule shall be the basis for determining contract earnings during each update period and therefore the amount of each progress payment. Lack of an approved schedule update or qualified scheduling personnel will result in an inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure of the Contractor to provide all information, as specified herein will result in the disapproval of the preliminary, initial and subsequent schedule updates. In the event schedule revisions are directed by the Contracting Officer and those revisions have not been included in subsequent revisions or updates, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until such revisions to the project schedule have been made. Activity cost loading shall be reasonable as determined by the Contracting Officer. The aggregate value of all activities coded to a contract CLIN as specified herein shall equal the value of the CLIN on the Schedule.

3.3. PROJECT SCHEDULE DETAILED REQUIREMENTS

The computer software system utilized to produce and update the project schedule shall be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule. Scheduling software that meets the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER-1-1-11(1995) referenced herein are Primavera Project Planner (P3) by Primavera, and Open Plan by Deltek.

3.3.1. Use of the Critical Path Method

Use the Critical Path Method (CPM) of network calculation to generate the project schedule. Prepare the project schedule using the Precedence Diagram Method (PDM).

3.3.2. Level of Detail Required

Develop the project schedule to an appropriate level of detail. Failure to develop the project schedule to an appropriate level of detail, as determined by the Contracting Officer, will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2.1. Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days. Procurement activities are defined herein.

3.3.2.2. Design and Permit Activities

Include design and permit activities, including necessary conferences and follow-up actions and design package submission activities. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This shall be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item.

3.3.2.3. Procurement Activities

Include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days. A typical procurement sequence includes the string of activities: submit, approve/review, procure, fabricate, and deliver.

3.3.2.4. Mandatory Tasks

Include and properly schedule the following tasks (See also the Sample Preliminary Submittal Register Input Form):

- 3.3.2.4.1. Submission, review and acceptance of design packages, including BIM
- 3.3.2.4.2. Submission of mechanical/electrical/information systems layout drawings
- 3.3.2.4.3. Submission and approval of O & M manuals
- 3.3.2.4.4. Submission and approval of as-built drawings
- 3.3.2.4.5. Submission and approval of 1354 data and installed equipment lists
- 3.3.2.4.6. Submission and approval of testing and air balance (TAB)
- 3.3.2.4.7. Submission of TAB specialist design review report

- 3.3.2.4.8. Submission and approval of fire protection specialist
- 3.3.2.4.9. Submission and approval of testing and balancing of HVAC plus commissioning plans and data. Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements.
- 3.3.2.4.10. Air and water balancing
- 3.3.2.4.11. HVAC commissioning
- 3.3.2.4.12. Controls testing plan submission
- 3.3.2.4.13. Controls testing
- 3.3.2.4.14. Performance Verification testing
- 3.3.2.4.15. Other systems testing, if required
- 3.3.2.4.16. Contractor's pre-final inspection
- 3.3.2.4.17. Correction of punch list from Contractor's pre-final inspection
- 3.3.2.4.18. Government's pre-final inspection
- 3.3.2.4.19. Correction of punch list from Government's pre-final inspection
- 3.3.2.4.20. Final Inspection

3.3.2.5. Government Activities. Show Government and other agency activities that could impact progress. These activities include but are not limited to: approvals, design reviews, review conferences, release for construction of design package(s), environmental permit approvals by State regulators, inspections, utility tie-ins, Government Furnished Property/Equipment (GFP) and Notice to Proceed for phasing requirements, if any.

3.3.2.6. Activity Responsibility Coding (RESP)

Assign Responsibility Code for all activities to the Prime Contractor, Subcontractor or Government agency responsible for performing the activity. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements. Code all activities not coded with a Government Responsibility Code to the Prime Contractor or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE). Unacceptable code values are abbreviations of the names of subcontractors.

3.3.2.7. Activity Work Area Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the activity is not resource or space constrained.

3.3.2.8. Contract Changes/Requests for Equitable Adjustment (REA) Coding (MODF)

Assign Activity code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer, with a Contract Changes/REA Code. Key all Code values to

the Government's modification numbering system. Any activity or sequence of activities added to the schedule as a result of alleged constructive changes made by the Government may be added to a copy of the current schedule, subject to the approval of the Contracting Officer. Assign Activity codes for these activities with a Contract Changes/REA Code. Key the code values to the Contractor's numbering system. Approval to add these activities does not necessarily mean the Government accepts responsibility and therefore liability for such activities and any associated impacts to the schedule, but rather the Government recognizes such activities are appropriately added to the schedule for the purposes of maintaining a realistic and meaningful schedule. Such activities shall not be Responsibility Coded to the Government unless approved. An activity shall not have more than one Contract Changes/REA Code

3.3.2.9. Contract Line Item (CLIN) Coding (BIDI)

Code all activities to the CLIN on the Contract Line Item Schedule to which the activity belongs. An activity shall not contain more than one CLIN Item Code. CLIN Item code all activities, even when an activity is not cost loaded.

3.3.2.10. Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities, based upon the phase of work in which the activity occurs. Code activities to either a Design Phase or a Construction Phase. Code fast track design and construction phases proposed by the Contractor to allow filtering and organizing the schedule by fast track design and construction packages. If the contract specifies construction phasing with separately defined performance periods, identify a Construction Phase Code to allow filtering and organizing the schedule accordingly. Each activity shall have only one Phase of Work code.

3.3.2.11. Category of Work Coding (CATW)

Assign Category of Work code to all Activities based upon the category of work which the activity belongs. Category of Work Code must include, but is not limited to: Design, Design Submittal, design reviews, review conferences, Construction Submittal, Approvals (if any), Acceptance, Procurement, Fabrication, Delivery, Weather Sensitive Installation, Non-Weather Sensitive Installation, Start Up, Test, and Turnover. Assign a Category of Work code to each activity. Each activity shall have only one Category of Work Code.

3.3.2.12. Definable Features of Work Coding (FOW1, FOW2, FOW3)

Assign a Definable Feature of Work Code to appropriate activities based on the definable feature of work to which the activity belongs. Definable Feature of Work is defined in Specification Section 01 45 04.00 10, Contractor Quality Control. An activity shall not have more than one Definable Feature of Work Code. Not all activities are required to be Definable Feature of Work Coded.

3.3.3. Scheduled Project Completion and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor. Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7 day calendar when the contract assigns calendar day durations for the activity such as a Government Acceptance activity. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Assign the Category of Work Code - Weather Sensitive Installation to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The Government will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.3.3.1. Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the project schedule an activity called "Start Project" or "NTP". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, with a zero day duration.

3.3.3.2. Schedule Constraints and Open Ended Logic

Constrain completion of the last activity in the schedule by the contract completion date. Schedule calculations shall result in negative float when the calculated early finish date of the last activity is later than the contract completion date. Include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the contract completion date for the project, and with a zero day duration or by using the "project must finish by" date in the scheduling software. The schedule shall have no constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero fee float" or "zero total float" are typically prohibited. There shall only be 2 open ended activities: Start Project (or NTP) with no predecessor logic and End Project with no successor logic.

3.3.3.3. Early Project Completion

In the event the Preliminary or Initial project schedule calculates an early completion date of the last activity prior to the contract completion date, the Contractor shall identify those activities that it intends to accelerate and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity shall have a late finish constraint equal to the contract completion date and the schedule will calculate positive float. The Government will not approve an early completion schedule with zero float on the longest path. The Government is under no obligation to accelerate activities for which it is responsible to support a proposed early contract completion.

3.3.4. Interim Completion Dates

Constrain contractually specified interim completion dates to show negative float when the calculated early finish date of the last activity in that phase is later than the specified interim completion date.

3.3.4.1. Start Phase

Include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2. End Phase

Include as the last activity for a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the specified completion date for that phase and a zero day duration.

3.3.4.3. Phase "X" Hammock

Include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" hammock activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5. Default Progress Data Disallowed

Do not automatically update Actual Start and Finish dates with default mechanisms that may be included in the scheduling software. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the AS and AF dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's updated schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Disable program features which calculate one of these parameters from the other.

3.3.6. Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an

updated project schedule. Correct out of sequence progress that continues for more than two update cycles by logic revision, as approved by the Contracting Officer.

3.3.7. Negative Lags and Start to Finish Relationships

Lag durations contained in the project schedule shall not have a negative value. Do not use Start to Finish relationships (SF).

3.3.8. Calculation Mode

Schedule calculations shall retain the logic between predecessors and successors even when the successor activity starts and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") will not be allowed.

3.3.9. Milestones

Include milestone activities for each significant project event including but not limited to: milestone activities for each fast track design package released for construction; design complete; foundation/substructure construction complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete.

3.4. PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1. Preliminary Project Schedule Submission

Submit the Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 15 calendar days after the NTP is acknowledged. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. Detail it for the first 90 calendar days. It may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as previously specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required Plan and Program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 calendar days. Schedule any construction activities planned for the first 90 calendar days after NTP. Constrain planned construction activities by Government acceptance of the associated design package(s) and all other specified Program and Plan approvals. Activity code any activities that are summary in nature after the first 90 calendar days with Responsibility Code (RESP) and Feature of Work code (FOW1, FOW2, FOW3)

3.4.2. Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. The Initial Schedule shall be at a reasonable level of detail as determined by the Contracting Officer. Include detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead procurement activities required prior to design completion. The Initial Project Schedule shall include the entire construction sequence and all fast track construction activities, with as much detail as is known at the time but, as a minimum, shall include all construction start and completion milestone activities, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated

designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone.

3.4.3. Design Package Schedule Submission:

With each design package submitted to the Government, submit a frag-net schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.4. Periodic Schedule Updates

Based on the result of the meeting specified in PERIODIC SCHEDULE UPDATE MEETINGS, submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made. Update the schedule to include detailed lower WBS activities procurement and construction activities as the design progresses, but not later than the submission of the final, un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission, if such activity is authorized.

3.4.5. Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. A template SDEF compatible schedule backup file (sdef.prx) is available on the QCS website: www.rmssupport.com. The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per Day
2	RESP	4	Responsible Party (e.g. GC, subcontractor, USACE)
3	AREA	4	Area of Work
4	MODF	6	Modification or REA number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of Work
7	CATW	1	Category of Work
8	FOW1	10	Feature of Work (used up to 10 characters in length)
9	FOW2	10	Feature of Work (used up to 20 characters in length)
10	FOW3	10	Feature of Work (used up to 30 characters in length)

3.5. SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1. Data CD's

Provide two sets of data CD's containing the project schedule in the backup format. Each CD shall also contain all previous update backup files. File medium shall be CD. Label each CD, indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file names. Each schedule shall have a unique file name as determined by the Contractor.

3.5.2. Narrative Report

Provide a Narrative Report with the Preliminary, Initial, and each Periodic Update of the project schedule, as the basis of the progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths where the total float is less than or equal to 20 work days, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to communicate to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through its analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not.

3.5.3. Approved Changes Verification

Include only those project schedule changes in the schedule submission that have been previously approved by the Contracting Officer. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4. Schedule Reports

The format, filtering, organizing and sorting for each schedule report shall be as directed by the Contracting Officer. Typically reports shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. The following lists typical reports that will be requested. One or all of these reports may be requested for each schedule submission.

3.5.4.1. Activity Report

A list of all activities sorted according to activity number.

3.5.4.2. Logic Report

A list of detailed predecessor and successor activities for every activity in ascending order sorted by activity number.

3.5.4.3. Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.4.4. Earnings Report by CLIN

A compilation of the Contractor's Total Earnings on the project from the NTP to the data date. This report shall reflect the earnings of specific activities based on the agreements made in the schedule update meeting defined herein. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining progress payments. Group activities by CLIN Item number and sort by activity number. This report shall: sum all activities coded to a particular CLIN and provide a CLIN Item percent earned value; and complete and sum CLIN items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5. Network Diagram

The network diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1. Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.5.2. Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3. Critical Path

Clearly show the critical path.

3.5.5.4. Banding

Organize activities as directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5. S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6. PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Meetings shall occur at least monthly within five days of the proposed schedule data date and after the Contractor has updated the schedule with Government concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intend to status. Match the actual start and finish dates with the dates exported, as described in paragraph 3.3.5. Provide a computer with the scheduling software loaded and a projector during the meeting which allows all meeting participants to view the proposed schedule update during the meeting. The meeting and resultant approvable schedule update shall be a condition precedent to a formal submission of the update as described in SUBMISSION REQUIREMENTS and to the submission of an invoice for payment. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity review the updated schedule on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the Government. The meeting will last no longer than 8 hours. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the Government 48 hours in advance of the meeting. The Contractor's Project Manager and Authorized Scheduler shall attend the meeting with the Authorized Representative of the Contracting Officer.

3.6.1. Update Submission Following Progress Meeting

Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the periodic schedule update meeting, reflecting only those changes made during the previous update meeting.

3.6.2. Status of Activities

Update status information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD) and Percent Complete shall be subject to the approval of the Government prior to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting:

3.6.2.1. Actual Start and Finish Dates

Accurately status the AS and/or AF dates for each activity currently in-progress or completed since the last update. The Government may allow an AF date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign AS dates when actual progress occurs on an activity.

3.6.2.2. Remaining Duration

Update the estimated RD for all incomplete activities independent of Percent Complete. Remaining durations may exceed the activity OD or may exceed the activity's prior update RD if the Government considers the current OD or RD to be understated based on current progress, insufficient work crews actually manning the job, unrealistic OD or deficiencies that must be corrected that restrain successor activities.

3.6.2.3. Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be statused 100 percent complete. To allow for proper schedule management, cost load the correction of punch list from Government pre-final inspection activity(ies) not less than 1% of the total contract value, which activity(ies) may be declared 100 percent complete upon completion and correction of all punch list work identified during Government pre-final inspection(s).

3.6.2.4. Logic Changes

Specifically identify and discuss all logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, and other changes that have been made pursuant to contract provisions. The Government will only approve logic revisions for the purpose of keeping the schedule valid in terms of its usefulness in calculating a realistic completion date, correcting erroneous logic ties, and accurately sequencing the work.

3.6.2.5. Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule that does not represent the actual or planned prosecution and progress of the work.

3.7. REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Contracting Officer: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of excusable delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is a condition precedent to any approvals by the Government. In response to each Request For Proposal issued by the Government, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Government impacts the critical path.

3.7.1. Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with its request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.2. Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

3.7.2.1. A list of affected activities, with their associated project schedule activity number.

3.7.2.2. A brief explanation of the causes of the change

3.7.2.3. An analysis of the overall impact of the changes proposed.

3.7.2.4. A sub-network of the affected area

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.7.3. Additional Submission Requirements

The Contracting Officer may request an interim update with revised activities for any requested time extension of over 2 weeks. Provide this disk within 4 days of the Contracting Officer's request.

3.7.4. If Progress Falls Behind the Approved Project Schedule

3.7.4.1. Should progress fall behind the approved schedule (more than 20 work days of negative float) due to Contractor generated problems, promptly provide a supplemental recovery or completion schedule that illustrates its efforts to regain time to assure a completion by the required contract completion date.

3.7.4.2. The supplemental recovery or completion schedule will not replace the original, approved schedule as the official contract schedule. Continue to update the original, approved schedule on at least a monthly basis. In addition, the Contractor and the Contracting Officer will monitor the supplemental recovery or completion schedule on at least a bi-weekly basis to determine its effect on regaining the rate of progress to assure project completion by the contractually required completion date.

3.7.4.3. Do not artificially improve progress by simply revising the schedule logic, modifying or adding constraints, or shortening future work activity durations. Resource and manpower load the supplemental recovery schedule or completion schedule with crew size and productivity for each remaining activity, indicating overtime, weekend work, and/or double shifts needed to regain the schedule, in accordance with FAR 52.236.15, without additional cost to the Government. Indicate assumptions made and the basis for any logic, constraint, or duration changes used in the creation of the supplemental recovery or completion schedule in a narrative submitted for the Contracting Officer's approval. Any additional resources or manpower must be evident at the work site. Do not modify the official contract schedule to include these assumptions.

3.7.4.4. Failure to perform work and maintain progress in accordance with the supplemental recovery or completion schedule may result in an interim and final unsatisfactory performance rating and/or may result in corrective action by the Contracting Officer in accordance with FAR 52.236-15.

3.8. DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The Contracting Officer will approve proposed revisions to the schedule prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of

receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9. WEEKLY PROGRESS MEETINGS

3.9.1. The Government and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Contracting Officer shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.

3.9.2. Provide a bar chart produced by the scheduling software, organized by Total Float and Sorted by Early Start Date, and a two week "look-ahead" schedule by filtering all schedule activities to show only current ongoing activities and activities schedule to start during the upcoming two weeks, organized by Work Area Code (AREA) and sorted by Early Start Date.

3.9.3. The Government and the Contractor shall jointly review the reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities), are not progressing satisfactorily and therefore could jeopardize timely project completion, corrective action must be taken immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Government responsibility coded activities require Government corrective action.

3.10. OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.11. TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Download and upload the schedule data into the Resident Management System (RMS) prior to RMS databases being transferred to the Government and is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and electronic export from QCS of the application for progress payment.

End of Section 01 32 01.00 10

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

1.0 GENERAL

- 1.1. DEFINITIONS
- 1.2. NOT USED
- 1.3. SUBMITTAL CLASSIFICATION
- 1.4. APPROVED OR CONCURRED WITH SUBMITTALS
- 1.5. DISAPPROVED SUBMITTALS
- 1.6. WITHHOLDING OF PAYMENT
- 1.7. GENERAL
- 1.8. SUBMITTAL REGISTER
- 1.9. SCHEDULING
- 1.10. TRANSMITTAL FORM (ENG FORM 4025)
- 1.11. SUBMITTAL PROCEDURES
- 1.12. CONTROL OF SUBMITTALS
- 1.13. GOVERNMENT APPROVED SUBMITTALS
- 1.14. INFORMATION ONLY SUBMITTALS
- 1.15. STAMPS

1.0 GENERAL

1.1. DEFINITIONS

1.1.1. Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2. Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

- Certificates of insurance.
- Surety bonds.
- List of proposed subcontractors.
- List of proposed products.
- Construction Progress Schedule.
- Submittal register.
- Schedule of prices.
- Accident Prevention Plan.
- Work plan.
- Quality control plan.
- Environmental protection plan.

SD-02 Shop Drawings

- Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.
- Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.
- Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

- Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.
- Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

- Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.
- Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.
- Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies that are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

- Calculations, mix designs, analyses or other data pertaining to a part of work.
- Design submittals, design substantiation submittals and extensions of design submittals.

SD-06 Test Reports

- Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must

have been within three years of date of contract award for the project.)

- Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
- Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
- Investigation reports.
- Daily checklists.
- Final acceptance test and operational test procedure.

SD-07 Certificates

- Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.
- Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
- Confined space entry permits.
- Text of posted operating instructions.

SD-08 Manufacturer's Instructions

- Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

- Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- Factory test reports.

SD-10 Operation and Maintenance Data

- Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

- Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

1.1.3. Approving Authority

Office authorized to approve submittal.

1.1.4. Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2. NOT USED

1.3. SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1. Designer of Record Approved (DA)

1.3.1.1. Designer of Record (DOR) approval is required for all extensions of design, critical materials, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". Provide the Government the number of copies designated hereinafter of all DOR approved submittals, after the DOR has taken appropriate action. The DOR shall ensure that submittals conform to the Solicitation, the Accepted Proposal and the completed design, however see below for those submittals proposing a deviation to the contract or a substitution of a material, system, or piece of equipment that was identified by manufacturer, brand name or model description in the accepted contract proposal.

1.3.1.2. The DOR shall ensure that the submittals comply with all applicable Buy American Act and Trade Agreement Act clauses in the contract. The DOR may confer with the Contracting Officer's Representative for advice and interpretation of those clauses, as necessary.

1.3.1.3. The Government may, but is not required to, review any or all DOR approved submittals for conformance to the solicitation, accepted proposal and the completed design. Except for submittals designated as deviating from the Solicitation, the Accepted Proposal or completed design, the Contractor may proceed with acquisition and installation upon DOR approval. Government Approved (GA)

1.3.2. Government Approved (GA)

Government approval is required for any item specifically designated as requiring Government approval in the Solicitation, for internal and external color finish selections and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.3.3. Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 **DESIGN AFTER AWARD** covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 33 16 **DESIGN AFTER AWARD**. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.3.4. Designer of Record Approved/Government Conformance Review (DA/CR)

1.3.4.1. Deviations to the Accepted Design. Designer of Record approval and the Government's concurrence are required for any proposed deviation from the accepted design which still complies with the contract (the Solicitation and Accepted Proposal) before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings." If necessary to facilitate the project schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if it deems it necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.

1.3.4.2. Substitutions. Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal.

1.3.5. Designer of Record Approved/Government Approved (DA/GA)

Any proposed deviation to the solicitation and/or the accepted proposal constitutes a change to the contract. In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is

authorized to proceed with material acquisition or installation for any proposed deviation to the contract. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.3.6. Information Only

All submittals not requiring Designer of Record or Government approval will be for information only. Provide the Government "For Information Only" copies of all submittals not requiring Government approval or concurrence, after the Designer of Record has taken the appropriate action.

1.4. APPROVED OR CONCURRED WITH SUBMITTALS

Do not construe the Contracting Officer's approval of or concurrence with submittals as a complete check, but only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval or concurrence will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. The Government won't consider re-submittals for the purpose of substituting previously approved materials or equipment unless accompanied by an explanation of why a substitution is necessary.

1.5. DISAPPROVED SUBMITTALS

Make all corrections required by the Contracting Officer, obtain the Designer of Record's approval when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Resubmit any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal as one requiring "approval" action, requiring both Designer of Record and Government approval. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, provide prompt notice in accordance with the Contract Clause "Changes" to the Contracting Officer.

1.6. WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.7. GENERAL

Make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, the Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, shall check, approve, sign, and stamp all items, indicating action taken. Clearly identify proposed deviations from the contract requirements. Include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Schedule and make submittals requiring Government approval prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples remaining upon completion of the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8. SUBMITTAL REGISTER (GA)

Develop a complete list of submittals, including each separate design package submittal. Submit the initial submittal register within 15 days after Notice to Proceed, including, as a minimum, the design packages and other initial submittals required elsewhere in the contract. The Designer of Record shall identify required submittals in the

specifications, and use the list to prepare the Submittal Register, utilizing the government-provided software, QCS (see Section 01 45 01.10), to create the ENG Form 4288. Appendix Ris a preliminary submittal register input form for use with the Quality Management System and the Resident Office Management System (QCS and RMS). The Government will provide the Contractor the actual Excel Spreadsheet version of this sample input form after award to modify and to use for input into QCS. The Excel Spreadsheet is not totally inputable into QCS, so additional keystroke input will be necessary. The sample input form is not all-inclusive. In addition, additional submittals may be required by other parts of the contract. After award, the parties will meet to discuss contract specific (or task order specific for a task order contract) distribution for the submittals all-inclusive and additional submittals may be required by other parts of the contract. Develop and complete the submittal register as the design is completed. Submit it to the Contracting Officer with the un-reviewed final design package submission or as soon as the design specifications are completed, if before the final design submission. When applicable, if the Contractor elects to fast track design and construction, using multiple design package submissions, update the submittal register to reflect the submittals associated with each design submission, clearly denoting all revisions to the previous submission. The submittal register serves as a scheduling document for submittals and for control of submittal actions throughout the contract period. Coordinate the submit dates and need dates used in the submittal register with dates in the Contractor prepared progress schedule. Submit monthly updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates or until all submittals have been satisfactorily completed. Revise and submit the submittal register when revising the progress schedule.

1.9. SCHEDULING

Schedule submittals covering component items forming a system or items that are interrelated to be coordinated and submitted concurrently. Schedule certifications to be submitted with the pertinent drawings. Allow adequate time (a minimum of 15 calendar days exclusive of mailing time) and show on the register for those items requiring Government approval or concurrence. No delay damages or time extensions will be allowed for time lost in late submittals by the Contractor.

1.10. TRANSMITTAL FORM (ENG FORM 4025)

Use the transmittal form (ENG Form 4025) for submitting submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor or are included in the QCS software if the Contractor is required to use QCS for this contract. Use a separate transmittal form for each specification section. Complete this form by filling out all the heading blank spaces and identify each item submitted. Exercise special care to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11. SUBMITTAL PROCEDURES

Make submittals as follows:

1.11.1. Procedures

The Government will further discuss detailed submittal procedures with the Contractor at the Post-Award Conference.

1.11.2. Deviations

For submittals which include proposed deviations requested by the Contractor, check the column "variation" of ENG Form 4025. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.12. CONTROL OF SUBMITTALS

Carefully control his procurement operations to ensure that each individual submittal is made on or before the scheduled submittal date shown on the approved "Submittal Register."

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred.. The Government will retain twenty six (26) copies of the submittal and return zero(0) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain zero(0) copies of information only submittals.

1.15. STAMPS

Use stamps similar to the following on the submittal data to certify that the submittal meets contract requirements:

CONTRACTOR

(FIRM NAME)

Approved

Approved with corrections as noted on submittal data and/or attached
sheet(s)

Signature:

Title:

Date:

For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record shall stamp and sign to certify that the submittal meets contract requirements.

**SECTION 01 33 16
DESIGN AFTER AWARD****1.0 GENERAL INFORMATION**

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3.9.1. Submittal Distribution and Quantities

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ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.1.1. The information contained in this section applies to the design required after award. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.

1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than six (6) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.

1.1.3. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.1.4. **INTEGRATED DESIGN.** To the maximum extent permitted for this project, use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for siting, energy, water, materials and indoor environmental quality and ensures incorporation of these goals. Consider all stages of the building lifecycle, including deconstruction.

1.2. DESIGNER OF RECORD

Identify, for approval, the Designer of Record ("DOR") that will be responsible for each area of design. One DOR may be responsible for more than one area. Listed, Professional Registered, DOR(s) shall account for all areas of design disciplines shall be accounted for by a listed. The DOR's shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). If the deliverables are not ready for release for construction, identify them as "preliminary" or "not for release for construction" or by using some other appropriate designation. The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

Submit for Government acceptance, a Design Quality Control Plan in accordance with Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL before design may proceed.

3.1.2. Post Award Conference

3.1.2.1. The government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractor representatives shall participate. All designers need not attend this first meeting. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

3.1.2.2. The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL), Partnering (see below and SCR: Partnering), and the initial design conference (see below).

3.1.2.3. The government will introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

3.1.3. Partnering & Project Progress Processes

3.1.3.1. The initial Partnering conference may be scheduled and conducted at any time with or following the post award conference. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality control staff, and contractor construction management staff. This partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses, shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, partnering meetings will be held at or in the vicinity of the project installation.

3.1.3.2. As part of the partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/ Furniture, Fixtures & Equipment (FF&E) design approval, project closeout, etc. The government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.1.4. Initial Design Conference

The initial design conference may be scheduled and conducted at the project installation any time after the post award conference, although it is recommended that the partnering process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference should be limited to site and is discouraged for other items. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone and to make sure any needs the contractor has are assigned and due dates established as well as who will get the information. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning the BIM Implementation Plan demonstration at this meeting. The DB Contractor shall conduct the initial design conference.

3.1.5. Pre-Construction Conference

Before starting construction activities, the Contractor and Government will jointly conduct a pre-construction administrative conference to discuss any outstanding requirements and to review local installation requirements for start of construction. It is possible there will be multiple Pre-Construction Conferences based on the content of the design packages selected by the Contractor. The Government will provide minutes of this meeting to all participants.

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

The stages of design submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for this project, within the parameters listed below. As a minimum, the Government expects to see at least one interim design submittal, at least one final design submittal before construction of a design package may proceed and at least one Design Complete submittal that documents the accepted design. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. See discussion on waivers to submission of one or more intermediate design packages where the parties partner during the design process. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning BIM and the various stages of design submittals and over-the-shoulder progress reviews.

3.2.1. Site/Utilities

To facilitate fast-track design-construction activities the contractor may submit a final (100%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comment, and resolution times from this specification apply, except that the Contractor shall allow the Government a 14 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2. Interim Design Submittals

The Contractor may submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01.00 10 PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal and to the Building Codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. See below for a waiver, where the parties establish an effective over-the-shoulder progress review procedure through the partnering process that would eliminate the need for or expedite a formal intermediate design review on one or more individual design packages.

3.2.3. Over-the-Shoulder Progress Reviews

To facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available within the Contractor's standard design practices) or at the Contractor's design offices or other agreed location, when practicable to the parties. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews shall normally be provided in electronic format, rather than in hard copy. If the Government and Contractor establish and implement an effective, mutually agreeable partnering procedure for regular (e.g., weekly) over-the-shoulder review procedures that allow the Government reviewers the opportunity to keep fully informed of the progress, contents, design intent, design documentation, etc. of the design package, the Government will agree to waive or to expedite the formal intermediate design review period for that package. The Contractor shall still be required to submit the required intermediate design documentation, however the parties may agree to how that material will be provided, in lieu of a formal consolidated submission of the package. It should be noted that Government funding is extremely limited for non-local travel by design reviewers, so the maximum use of virtual teaming methods must be used. Some possible examples include electronic file sharing, interactive software with on-line or telephonic conferencing, televideo conferencing, etc. The Government must still perform its Code and Contract conformance reviews, so the Contractor is encouraged to partner with the reviewers to find ways to facilitate this process and to facilitate meeting or bettering the design-build schedule. The Contractor shall maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal intermediate design review. The formal intermediate

review procedures shall form the contractual basis for the official schedule, in the event that the partnering process determines that the formal intermediate review process to be best suited for efficient project execution. However, the Government pledges to support and promote the partnering process to work with the Contractor to find ways to better the design schedule.

3.2.4. Final Design Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5. Design Complete Submittals

After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a back-check review and submit the final, design complete documents, which shall represent released for construction documents. The requirements for the design complete submittals are described hereinafter.

3.2.6. Holiday Periods for Government Review or Actions

Do not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving). Exclude such dates and periods from any durations specified herein for Government actions.

3.2.7. Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the government in writing, at least one (1) week prior to the submittal, in order to accommodate the Government reviewers' other scheduled activities. If a design submittal is over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submission receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, the Suspension of Work and Defaults clauses provide the respective remedy or relief for the delay.

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (See Special Contract Requirement: Deviating From the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System" (see below and Attachment C).

3.3.2. Tracking Design Review Comments

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. See Attachment C for details on how to establish an account and set-up the DrChecks system for use on the project.

3.3.3. Design and Code Checklists

Develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation. See Section 01 45 04.00 10 Contractor Quality Control, Attachment D for a Sample Fire Protection and Life Safety Code review checklist and Attachment E for LEED SUBMITTALS.

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submission and proceed directly to final design on the sitework and utilities package). The DB Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued government concurrence with the design work. Include the interim submittal review periods and conferences in the project schedule and indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below. See also Paragraph: **Over-the-Shoulder Progress Reviews** for a waiver to the formal interim design review.

3.4.2. Procedures

After receipt of an Interim Design submission, allow the Government fourteen (14) calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the-shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the COR will furnish, to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. Furnish disposition of all comments, in writing, through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately. The Interim Review conference will be held for each design submittal at the installation. Bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

3.4.3. Conference Documentation

3.4.3.1. In order to facilitate and accelerate the Government code and contract conformance reviews, identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

3.4.3.2. The DB Contractor shall prepare meeting minutes and enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Incorporate valid comments. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain government concurrence with the design work presented.

3.5. INTERIM DESIGN REQUIREMENTS

Interim design deliverables shall include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

3.5.1. Drawings

Include comments from any previous design conferences incorporated into the documents to provide an interim design for the "part" submitted.

3.5.2. Design Analyses

3.5.2.1. The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references and pay particular attention to the following listed items:

3.5.2.2. For parts including sitework, include site specific civil calculations.

3.5.2.3. For parts including structural work, include structural calculations.

- (a) Identify all loads to be used for design.
- (b) Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
- (c) Provide calculations for all principal roof, floor, and foundation members and bracing and secondary members.
- (d) Provide complete seismic analyses for all building structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone for which the facility is being constructed.
- (e) Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.
- (f) See also the Security (Anti-Terrorism) requirements below for members subject to Anti-Terrorist Force Protection (ATFP) and Progressive Collapse requirements.
- (g) Fully coordinate and integrate the overall structural design between two different or interfacing construction types, such as modular and stick-built or multistory, stacked modular construction. Provide substantiation of structural, consolidation/settlement analysis, etc., as applicable, through the interfaces.

3.5.2.4. For Security (Anti-Terrorism): Provide a design narrative and calculations where applicable, demonstrating compliance with each of the 22 standards in UFC 4-010-01, which includes Design of Buildings to Resist Progressive Collapse (use the most recent version of UFC 4-023-03, regardless of references to any specific version in UFC 4-010-01). Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. Show complete calculations for members subjected to ATFP loads, e.g., support members of glazed items (jambes, headers, sills) connections of windows to support members and connections of support members to the rest of the structure. For 3 story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.

3.5.2.5. For parts including architectural work, include building floor area analysis.

3.5.2.6. For parts including mechanical work, include HVAC analysis and calculations. Include complete design calculations for mechanical systems. Include computations for sizing equipment, compressed air systems, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation is required (see paragraph 3.5.5.2 for list of acceptable software). Based on the results of calculations, provide a complete list of the materials and equipment proposed with the manufacturer's published cataloged product installation specifications and roughing-in data.

3.5.2.7. For parts including life safety, include building code analysis and sprinkler and other suppression systems. Notwithstanding the requirements of the Codes, address the following:

- (a) A registered fire protection engineer (FPE) must perform all fire protection analyses. Provide the fire protection engineer's qualifications. See Section 01 10 00, paragraph 5 for qualifications.

- (b) Provide all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.
- (c) Provide classification of each building in accordance with fire zone, building floor areas and height and number of stories.
- (d) Provide discussion and description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Electronic Systems.
- (e) Provide hydraulic calculations based on water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply. Include copies of Contractor's water flow testing done to certify the available water source.

3.5.2.8. For parts including plumbing systems:

- (a) List all references used in the design.
- (b) Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.
- (c) Detail calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping; LP gas piping and tanks, fuel oil piping and tanks, etc., as applicable.
- (d) When the geotechnical report indicates expansive soils are present, indicate in the first piping design submittal how piping systems will be protected against damage or backfall/backflow due to soil heave (from penetration of slab to the 5 foot building line).

3.5.2.9. For elevator systems:

- (a) List all criteria codes, documents and design conditions used.
- (b) List any required permits and registrations for construction of items of special mechanical systems and equipment.

3.5.2.10. For parts including electrical work, include lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations.

3.5.2.11. For parts including telecommunications voice/data (including SIPRNET, where applicable), include analysis for determining the number and placement of outlets

3.5.2.12. For Cathodic Protection Systems, provide the following stamped report by the licensed corrosion engineer or NACE specialist with the first design submission. The designer must be qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. He/she must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection Specialist, or must be a registered professional engineer with a minimum of five years experience in corrosion control and cathodic protection. Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.

3.5.3. Geotechnical Investigations and Reports:

3.5.3.1. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc. Provide an assessment of post-construction settlement potential including total and differential. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required. Include calculations to support the recommendations for bearing capacity, settlement, and pavement sections. Include supporting documentation for all recommended

design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), etc. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. Include the raw field data. Arrange a meeting with the Government subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the Government provided preliminary soils information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the Government furnished preliminary soils investigation, which result in a change to the design or construction. Any equitable adjustment is subject to the provisions of the contract's Differing Site Conditions Clause.

3.5.3.2. Vehicle Pavements: The Contractor's geotechnical report shall contain flexible and rigid pavement designs, as applicable for the project, including design CBR and modulus of subgrade reaction and the required compaction effort for subgrades and pavement layers. Provide Information on the types of base course materials available in the area and design strengths.

3.5.3.3. The Contractor and the professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

3.5.4. LEED Documentation:

Assign a LEED Accredited Professional, responsible to track LEED planning, performance and documentation for each LEED credit through construction closeout. Incorporate LEED credits in the plans, specifications and design analyses. Develop LEED supporting documentation as a separable portion of the Design Analysis and provide with each required design submittal. Include the LEED Project checklist for each non-exempt facility (one checklist may be provided for multiple facilities in accordance with the LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects and the LEED SUBMITTALS (Attachment E, herein) with each submittal. Final design submittal for each portion of the work must include all required design documentation relating to that portion of work (example - all site credit design documents with final site design). Submittal requirements are as indicated in Attachment E, LEED SUBMITTALS. Submit all documentation indicated on Attachment E as due at final design at final design submittal (for fast-track projects with multiple final design submittals, this shall be at the last scheduled final design submittal). All project documentation related to LEED shall conform to USGBC requirements for both content and format, including audit requirements and be separate from other design analyses. Maintain and update the LEED documentation throughout project progress to construction closeout and shall compile product data, receipts, calculations and other data necessary to substantiate and support all credits claimed. The Government may audit any or all individual credits. Audit documentation is not required to be submitted unless requested. These requirements apply to all projects. If the project requires the Contractor to obtain USGBC certification, the Contractor shall also be responsible for obtaining USGBC certification and shall provide written evidence of certification with the construction closeout LEED documentation submittal. Install the USGBC building plaque at the location indicated by the Government upon receipt. If Contractor obtains USGBC interim design review, submit the USGBC review to the Government within 30 days of receipt for information only.

3.5.4.1. LEED Documentation for Technology Solution Set. If the Solicitation provides a Prescriptive Technology Solution Set, use of the Technology Solution set has no effect on LEED documentation requirements. Provide all required LEED documentation, including energy analysis, in accordance with LEED requirements when using the Technology Solution Set.

3.5.5. Energy Conservation:

3.5.5.1. Refer to Section 01 10 00, Paragraph 5. Interim and Final Design submittals shall demonstrate that each building including the building envelope, HVAC systems, service water heating, power, and lighting systems meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Use Compliance Documentation forms available from ASHRAE and included in the ASHRAE 90.1 User's Manual for this purpose. The Architectural Section of the Design Analysis shall include completed forms titled "Building Envelope

Compliance Documentation Parts I and II". The Heating Ventilating and Air Conditioning (HVAC) Section of the Design Analysis shall include a completed form titled "HVAC Simplified Approach Option - Part I" if this approach is allowed by the Standard. Otherwise, the HVAC Section of the Design Analysis shall include completed forms titled "HVAC Mandatory Provisions - Part II" and "HVAC Prescriptive Requirements - Part III". The Plumbing Section of the Design Analysis shall include a completed form titled "Service Water Heating Compliance Documentation". The Electrical Section of the Design Analysis shall include an explanatory statement on how the requirements of ASHRAE 90.1-2004 Chapter 8 Power were met. The Electrical Section of the Design Analysis shall also include a completed form titled "Lighting Compliance Documentation".

3.5.5.2. Interim and Final Design submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must also include calculations in a separate Energy Conservation Section of the Design Analysis which demonstrate and document (a) the baseline energy consumption for the facility or facilities under contract, that would meet the requirements of ANSI/ASHRAE/IESNA Standard 90.1 and (b) the energy consumption of the facility or facilities under contract utilizing the materials and methods required by this construction contract. Use the USGBC Energy and Atmosphere (EA) Credit 1 compliance template / form or an equivalently detailed form for documenting compliance with the energy reduction requirements. This template / form is titled PERFORMANCE RATING METHOD and is available when the project is registered for LEED. The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with two exceptions: a) receptacle and process loads may be omitted from the calculation; and b) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline for rating above standard design meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction. This calculation shall address all energy consuming systems in a single integrated methodology. Include laboratory fume hoods and kitchen ventilation loads in the energy calculation. They are not considered process loads. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable. The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

3.5.6. Specifications

Specifications may be any one of the major, well known master guide specification sources (use only one source) such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. (including specifications from these sources). Manufacturers' product specifications, utilizing CSI's Manu-Spec, three part format may be used in conjunction with the selected specifications. The designers of record shall edit and expand the appropriate Specifications to insure that all project design requirements, current code requirements, and regulatory requirements are met. Specifications shall clearly identify, where appropriate, specific products chosen to meet the contract requirements (i.e., manufacturers' brand names and model numbers or similar product information).

3.5.7. Building Rendering

Present and provide a draft color computer, artist, or hand drawn rendering with the conceptual design submittal of the building exterior. Perspective renderings shall include a slightly overhead view of the entire building to encompass elevations and the roof configuration of the building. After Government review and acceptance, provide a final rendering, including the following:

Three (3) 18" x 24" color prints, framed and matted behind glass with project title underneath the print.

One (1) Image file (high resolution) in JPG format on CD for those in the submittal distribution list.

3.5.8. Interim Building Design Contents

The following list represents what the Government considers should be included in the overall completed design for a facility or project. It is not intended to limit the contractor from providing different or additional information as needed to support the design presented, including the require design analyses discussed above. As the Contractor develops individual design packages and submits them for Interim review, include as much of the applicable

information for an individual design package as is developed at the Interim design level for review purposes. These pieces shall be developed as the design progresses toward the design complete stage.

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

- (a) Design Narrative
- (b) Architectural Floor Plans, Typical Wall and Roof Sections, Elevations
- (c) Finish schedule
- (d) All required equipment
- (e) Special graphics requirements
- (f) Door and Window Schedules
- (g) Hardware sets using BHMA designations
- (h) Composite floor plan showing all pre-wired workstations
- (i) Structural Interior Design (SID) package: See ATTACHMENT A for specific requirements
- (j) Furniture, Fixtures & Equipment (FF&E) design package: See ATTACHMENT B for specific requirements

3.5.8.4. Structural Systems. Include:

- (a) Drawings showing principal members for roof and floor framing plans as applicable
- (b) Foundation plan showing main foundation elements where applicable
- (c) Typical sections for roof, floor, and foundation conditions

3.5.8.5. Plumbing Systems

- (a) Show locations and general arrangement of plumbing fixtures and major equipment
- (b) Plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Include natural gas (and meter as required), (natural gas and meter as required), (LP gas), (fuel oil) and other specialty systems as applicable.
- (c) Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required

3.5.8.6. HVAC Systems

- (a) Mechanical Floor Plans: The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:
 - (1) Room designations.
 - (2) Mechanical legend and applicable notes.
 - (3) Location and size of all ductwork and piping.
 - (4) Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards).
 - (5) Pre-Fabricated Paint Spray Booth (where applicable to project scope)
 - (6) Paint Preparation Area (where applicable to project scope)
 - (7) Exhaust fans and specialized exhaust systems.
 - (8) Thermostat location.
 - (9) Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).
 - (10) Location of all air handling equipment.

- (11) Air balancing information.
- (12) Flue size and location.
- (13) Piping diagram for forced hot water system (if used).
- (b) Equipment Schedule: Provide complete equipment schedules. Include:
 - (1) Capacity
 - (2) Electrical characteristics
 - (3) Efficiency (if applicable)
 - (4) Manufacturer's name
 - (5) Optional features to be provided
 - (6) Physical size
 - (7) Minimum maintenance clearances
- (a) Details: Provide construction details, sections, elevations, etc., only where required for clarification of methods and materials of design.
- (b) HVAC Controls: Submit complete HVAC controls equipment schedules, sequences of operation, wiring and logic diagrams, Input/Output Tables, equipment schedules, and all associated information. See the Statement of Work for additional specific requirements.

3.5.8.7. Fire Protection and Life Safety.

- (a) Provide plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Include the following types of information:
 - (1) The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.
 - (2) The location and coverage of any fire detection systems
 - (3) The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.)
 - (4) The location of any other major fire protection equipment
 - (5) Indicate any hazardous areas and their classification
 - (6) Schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required
- (b) Working plans and all other materials submitted shall meet NFPA 13 requirements, with respect to required minimum level of detail.

3.5.8.8. Elevators. Provide:

- (a) Description of the proposed control system
- (b) Description, approximate capacity and location of any special mechanical equipment for elevators.

3.5.8.9. Electrical Systems.

- (a) Electrical Floor Plan(s): Show all principle architectural features of the building which will affect the electrical design. Show the following:
 - (1) Room designations.
 - (2) Electrical legend and applicable notes.
 - (3) Lighting fixtures, properly identified.
 - (4) Switches for control of lighting.
 - (5) Receptacles.

- (6) Location and designation of panelboards. Clearly indicate type of mounting required (flush or surface) and reflect accordingly in specifications.
- (7) Service entrance (conduit and main disconnect).
- (8) Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.
- (b) Building Riser Diagram(s) (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.
- (c) Load Center Panelboard Schedule(s): Indicate the following information:
 - (1) Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting.
 - (2) Branch Circuit Designations.
 - (3) Load Designations.
 - (4) Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
 - (5) Branch Circuit Connected Loads (AMPS).
 - (6) Special Features
- (d) Lighting Fixture Schedule(s): Indicate the following information:
 - (1) Fixture Designation.
 - (2) General Fixture Description.
 - (3) Number and Type of Lamp(s).
 - (4) Type of Mounting.
 - (5) Special Features.
- (e) Details: Provide construction details, sections, elevations, etc. only where required for clarification of methods and materials of design.

3.5.8.10. Electronic Systems including the following responsibilities:

- (a) Fire Detection and Alarm System. Design shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.)
- (b) Fire Suppression System Control. Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Clearly describe how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. Designate all components shown on floor plans "FS system components" (as opposed to "Fire Alarm components"). Show location of FS control panels, HVAC control devices, sensors, and 120V power panel connections on floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors sub-zoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and under floor detectors with distinct symbols and indicate sub-zone of each.
- (c) Public Address System
- (d) Special Grounding Systems. Completely reflect all design requirements in the specifications and drawings. Specifications shall require field tests (in the construction phase), witnessed by the Government, to determine the effectiveness of the grounding system. Include drawings showing existing construction, if any.
- (e) Cathodic Protection.
- (f) Intrusion Detection, Card Access System
- (g) Central Control and Monitoring System
- (h) Mass Notification System
- (i) Electrical Power Distribution Systems

3.5.8.11. Separate detailed Telecommunications drawings for Information Systems including the following responsibilities:

- (a) Telecommunications Cabling
- (b) Supporting Infrastructure
- (a) Outside Plant (OSP) Cabling - Campus or Site Plans - Exterior Pathways and Inter-Building Backbones
 - (a) Include a layout of the voice/data outlets (including voice only wall & pay phones) on telecommunication floor plan drawing, location of SIPRNET data outlets (where applicable), and a legend and symbol definition to indicate height above finished floor. Show size of conduit and cable type and size on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Show underground distribution conduit and cable with sizing from point of presence to entrance facility of building.
 - (b) Layout of complete building per floor - Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways including Serving Zones Drawings - Drop Locations and Cable ID's
 - (c) Communication Equipment Rooms - Plan Views - Tech and AMEP/Elevations - Racks and Walls. Elevations with a detailed look at all telecomm rooms. Indicate technology layout (racks, ladder-racks, etc.), mechanical/electrical layout, rack elevation and backboard elevation. They may also be an enlargement of a congested area of T1 or T2 series drawing.

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

A final design review and review conference will be held upon completion of final design at the project installation, or – where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.) through the Partnering process. Include the final design conference in the project schedule and shall indicate what part of the design work is at 100% completion. The final design conference will be held after the Government has had seven (7) calendar days after receipt of the submission to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter period.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, submittal register and design analyses for Government review and acceptance. The 100% design submission shall consist of drawings, specifications, updated design analyses and any permits required by the contract for each package submitted. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date. Include the 100% SID and 100% FF&E binders for government approval. The Contractor shall have performed independent technical reviews (ITR's) and back-checks of previous comment resolutions, as required by Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL, including providing documentation thereof. Use DrChecks or other acceptable comment tracking system during the ITR and submit the results with each final design package

3.7.1. Drawings

3.7.1.1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted.

3.7.1.2. Prepare all drawings with the Computer-Aided Design and Drafting (CADD)/Computer-Aided Design (CAD) system, organized and easily referenced electronically, presenting complete construction information.

3.7.1.3. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.

3.7.1.4. Provide detail drawings that illustrate conformance with the contract. Include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules that agree with the submitted SID binders.

3.7.1.5. The design documents shall be in compliance with the latest version of the A/E/C CAD Standard, available at <https://cadbim.usace.army.mil/CAD>. Use the approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.

3.7.1.6. CAD System and Building Information Modeling (BIM) (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order.)

All CAD files shall be fully compatible with MicroStation V8 or higher. Save all design CAD files as MicroStation V8 or higher files. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8 Workspace.

(a) CAD Data Final File Format: During the design development capture geo-referenced coordinates of all changes made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc) as a result of this contract. There is no mandatory methodology for how the geo-referenced coordinates will be captured, however, Engineering and Construction Bulletin No. 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects identifies the format for final as-built drawings and data sets to be delivered to the government. Close-out requirements at the as-built stage; require final geo-referenced GIS Database of the new facility along with all exterior modifications. The Government will incorporate this data set into the Installation's GIS Masterplan or Enterprise GIS System. See also, Section 01 78 02.00 10 Closeout Submittals.

(b) Electronic Drawing Files: In addition to the native CAD design files, provide separate electronic drawing files (in editable CAD format and Adobe Acrobat PDF version 7.0 or higher) for each project drawing.

(c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Fonts that are not included as part of the default CAD software package installation or recognized as an allowable font by the A/E/C CAD Standard are not acceptable in delivered CAD files. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.

(d) Deliver BIM Model and associated Facility Data files in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F. See Attachment F for additional BIM requirements.

(e) Drawing Index: Provide an index of drawings sheet in CAD as part of the drawing set, and an electronic list in Microsoft Excel of all drawings on the CD. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title, containing the data for each drawing.

(f) Hard Copies: Plot submitted hard copy drawings directly from the "electronic drawing files" and copy for quantities and sizes indicated in the distribution list at the end of this specification section. The Designers of Record shall stamp, sign and date original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.7.2. Design Analyses

3.7.2.1. The designers of record shall update, finalize and present design analyses with calculations necessary to substantiate and support all design documents submitted.

3.7.2.2. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where, applicable (name, version, vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned government reviewer.

3.7.2.3. All disciplines review the LEED design analysis in conjunction with their discipline-specific design analysis; include a copy of the separable LEED design analysis in all design analysis submittals.

3.7.2.4. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3. Specifications

Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

Prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00, SUBMITTAL PROCEDURES) with each design package. Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project, for the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will furnish the DB Contractor's design manager a DD Form 1354 checklist to use to produce a draft Form 1354. Submit the completed checklist and prepared draft Form DD 1354 with the 100% design in the Design Analysis. The Corps will use these documents to complete the final DD 1354 upon completion of construction.

3.7.6. Acceptance and Release for Construction

3.7.6.1. At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Officer or the ACO will accept the Final Design Submission for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.7.6.2. Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted contract proposal, or limit the Contractor's responsibility of design as prescribed under Special Contract Requirement: "Responsibility of the Contractor for Design" or limit the Government's rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design Submission and Review Conference and after Government acceptance of the Final Design submission, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the final, design complete documents. Label the final design complete documents "FOR CONSTRUCTION" or use similar language. In addition to the final drawings and specifications, the following deliverables are required for distribution and field use. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the Government may perform a back-check of the released for construction documentation. Promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

General: The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. Provide copies of each design submittal and design substantiation as follows (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order):

Activity and Address	Drawing Size (Full Size) Arch D Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) [Not Supplied - Submittal Req Distribution : HALF SIZE] Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF & .dgn)	Furniture Submittal (Per Attachment B)	Structural Interior Design Submittal	BIM Data DVD (Per Attachment F)
Commander, U.S. Army Engineer District [Not Supplied - District Information General : CONSTRUCTION DISTRICT]	4/0	0/0	0/0	0	1	0	2
Commander, U.S. Army Engineer District, Center of Standardization Mobile District	2/0	0/0	0/0	0	N/A	0	0
Installation	10/0	0/0	0/0	0	2	0	2
U.S. Army Corps of Engineers Construction Area Office	6/0	0/0	0/0	0	1	0	5
Information Systems Engineering Command (ISEC)	0/0	0/0	0/0	1	N/A	N/A	1
Other Offices	4/0	0/0	0/0	0	N/A	0	0

***NOTE:** For partial sets of drawings, specifications and design analyses, see paragraph 3.9.3.3, below.

****NOTE:** When specified below in 3.9.2, furnish Installation copies of Drawings as paper copies, in lieu of the option to provide secure web-based submittals.

3.9.2. Web based Design Submittals

Except for full or half-sized drawings for Installation personnel, as designated in the Table above, Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the

contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to six (6) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

3.9.3.2. Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

3.9.3.3. Provide partial sets of drawings, specifications, design analyses, etc., as designated in the Table in paragraph 3.9.1, to those reviewers who only need to review their applicable portions of the design, such as the various utilities. The details of which office receives what portion of the design documentation will be worked out after award.

3.10. AS-BUILT DOCUMENTS

Provide as-built drawings and specifications in accordance with Section 01 78 02.00 10, CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes

All tile information, including tile grout color and tile patterns.

- All flooring finishes, including patterns.
- All door, door frame finishes and door hardware finishes
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim

- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All Roof Finishes
- All Brick and Cast Stone Samples
- All Exterior Insulation and Finish Samples
- All Glass Color Samples
- All Exterior Metals Finishes
- All Window & Door Frame Finishes
- All Specialty Item Finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

ATTACHMENT B
FURNITURE, FIXTURES & EQUIPMENT (FF&E) REQUIREMENTS

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

1.1. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The Contractor's interior designer, not a furniture dealer, shall develop the design. FF&E is the selection, layout, specification and documentation of furniture includes but is not limited to workstations, seating, tables, storage and shelving, filing, trash receptacles, clocks, framed artwork, artificial plants, and other accessories. Contract documentation is required to facilitate pricing, procurement and installation. The FF&E package is based on the furniture footprint developed in the Structural Interior Design (SID) portion of the interior design. Develop the FF&E package concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, J-boxes, communication outlets and connections, and lighting as appropriate. In addition, coordinate layout with other building features such as architectural elements, thermostats, location of TV's, GF/GI equipment (for example computers, printers, copiers, shredders, faxes), etc. Locate furniture in front of windows only if the top of the item falls below the window and unless otherwise noted, do not attach furniture including furniture systems to the building. If project has SIPRNET and/or NIPRNET, coordinate furniture layout with SIPRNET and NIPRNET separation requirements. Verify that access required by DOIM for SIPRNET box and conduit is provided. The DOR shall interview appropriate Government personnel to determine FF&E requirements for furniture and furnishings prior to preparation of the scheme to be presented. Determine FFE items and quantities by, but not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function, (3) room functions, (4) rank and grade. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

Design may proceed to final with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide unbound, electronic drawings in CAD and BIM. Provide all files needed to view complete drawings. Submit all text documents in Microsoft Word or Excel..

Submit four copies of the final and complete FF&E information and samples in 8 1/2" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 1/2". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

Design submittal requirements include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form

Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include:

- (a) Furniture item illustration and code
- (b) Furniture item name
- (c) Job name, location, and date
- (d) General Services Administration (GSA) FSC Group, part, and section
- (e) Manufacturer, Product name and Product model number or National Stock Number (NSN)
- (f) Finish name and number (code to finish samples)
- (g) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples)
- (h) Dimensions
- (i) Item location by room number and room name
- (j) Quantity per room
- (k) Total quantity
- (l) Special instructions for procurement ordering and/or installation (if applicable)
- (m) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to:
 - (1) required features and characteristics
 - (2) ergonomic requirements
 - (3) functional requirements
 - (4) testing requirements
 - (5) furniture style
 - (6) construction materials
 - (7) minimum warranty

The following is an example for “m” features and characteristics, ergonomic requirements and functional requirements:

Chair Description:

- (1) Mid-Back Ergonomic Task Chair
- (2) Pneumatic Gaslift; Five Star Base
- (3) Mesh Back; Upholstered Seat
- (4) Height and Width Adjustable Task Arms:
 - a. Arm Height: 6”- 11” (+-1/2”)
 - b. Arm Width: 2”– 4” adjustment
- (5) Height Adjustable Lumbar Support
- (6) Adjustable Seat Height 16”-21” (+- 1”)
- (7) Sliding Seat Depth Adjustment 15”-18” (+-1”)
- (8) Standard Hard Casters (for carpeted areas)
- (9) Overall Measurements:
 - a. Overall width: 25” - 27”
 - b. Overall depth: 25”– 28”

- (10) Must have a minimum of the following adjustments (In addition to the above):
- 360 Degree Swivel
 - Knee-Tilt with Tilt Tension
 - Back angle
 - Forward Tilt
 - Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

- Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)
- Minimum noise reduction coefficient (NRC)
- Minimum sound transfer coefficient (STC)
- Minimum flame spread and smoke development
- UL testing for task lighting and electrical system
- Panel widths and heights and their locations (this may be done on the drawings) Worksurface types and sizes (this may be done on the drawings)
- Worksurface edge type
- Varying panel/cover finish materials and locations (locations may be shown on the drawings)
- Storage requirements
- Keyboard requirements
- Lock and keying requirements
- Accessory components (examples: tack boards, marker boards, paper management)
- Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)
- Locations of communication cables (base, beltline, below and/or above beltline, top channel)
- Types of electrical outlets
- Types of communication jacks; provided and installed by others
- Locations of electrical outlets and communication jacks (this may be done on the drawings)
- Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Alternate Manufacturer List

Provide a table consisting of major furniture items that lists the manufacturers products specified on the Order Form and two alternate manufacturers. Major furniture items include, but are not limited to, casegoods, furniture systems, seating, and tables. Organize matrix by item code and item name. Supply alternates that are available on GSA Schedule and meet the requirements of the Furniture Order Form. One of the two alternates must be from UNICOR if possible. Provide manufacturer name address, telephone number, product series and product name for each alternate manufacturer.

1.1.4. FF&E Procurement List

Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.

1.1.5. Points of Contact (POCs)

Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and email, include each contact's job function. Divide the FF&E package into different sections based on this listing, applies to order forms and cost estimates.

1.1.6. Color Boards

Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate

Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency, installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be use in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

Provide floor Plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. Key all the items on the drawings by furniture item code. Do not provide manufacturer specific information such as product names and numbers on drawings, Drawings shall be non-proprietary. This is typical for FFE on all plans, including those mentioned below.

1.2.2. Workstation Plans

Show each typical workstation configuration in plan view, elevations or isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Identify workstations using the same numbering system as shown on the project drawings. Key components to a legend on each sheet which identifies and describes the components along with dimensions. Provide the plan, elevations and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans

Show panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project), powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans

Provide typical free standing desk configurations in plan view, elevation or isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans

Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans

Show power provisions including type and locations of feeder components, activated outlets and other electrical components. Show locations and quantities of outlets for workstations. Clearly identify different outlets, i.e. electrical, LAN and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans

Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height.

1.2.8. Window Drapery Plans

Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material, drapery size and type, draw direction, location and quantities.

1.3. FURNITURE SELECTION

1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification for items not available on the GSA Schedules.

1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections, example: Steelcase, Turnstone, Brayton International, Metro, and Vecta are all Steelcase companies. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to make some selections from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specify modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.

1.4.2. Specify workstations and storage of steel construction. Provide worksurface tops constructed to prevent warpage. Provide user friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and worksurfaces are completely and smoothly finished. Provide abutting worksurfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level worksurface.

1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open

1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are

allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.

1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 55,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions.

1.6. ACCESSORIES

1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage. Provide tackable surfaces at workstations with overhead storage.

1.6.2. Not Used.

1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under worksurface.

1.7. MISSION UNIQUE EQUIPMENT

Funding for FF&E furniture items and mission unique equipment (MUE) items are from two different sources. Separate the designs and procurement documentation for FFE items and MUE. MUE includes, but is not limited to, items such as industrial shelving, workbenches, appliances, fitness equipment, IT equipment and supporting carts. The User will purchase and install mission unique equipment items, unless otherwise noted. Identify locations of known MUE items such as industrial shelving, workbenches, appliances, etc. for space planning purposes.

1.8. SUSTAINABILITY

1.8.1. For all designs provided regardless of facility type, make every effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider: **Material Chemistry and Safety of Inputs** (What chemicals are used in the construction of the selections?); **Recyclability** (Do the selections contain recycled content?); **Disassembly** (Can the selections be disassembled at the end of their useful life to recycle their materials?).

1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry ([MBDC](#)) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "third-party" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General.

Where appropriate, design furniture systems in open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typicals and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector

system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Panels shall be capable of structurally supporting more than 1 fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical And Information/Technology (IT)

Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 10 00, paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation to workstation.

1.9.5. Pedestals

Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

1.10.1. Design for executive furniture in command areas, coordinate specific locations with Corps of Engineers Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood casegoods, seating and tables. Select executive furniture casegoods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.

1.10.2. Specify furniture with wood veneer finish (except worksurfaces) with mitered solid wood edge of same wood type. Provide worksurface plastic laminate that closely matches adjacent wood veneer. Other executive office furniture such as seating, tables, executive conference room furniture, etc. shall be compatible in style, finish and color with executive furniture casegoods.

1.11. SEATING

1.11.1. General

Specify appropriate chair casters and glides for the floor finish where the seating is located. Universal casters that are appropriate for both hard surface flooring and carpet are preferred. All seating shall support up to a minimum of 250 lbs.

1.11.2. Desk and Guest Seating

Select ergonomic desk chairs with casters, non-upholstered adjustable arms, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, pneumatic seat height adjustment, and padded, contoured upholstered seat and back. Desk and guest chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Depending on scale of desk chair provide seat pan forward and back adjustment to increase or decrease depth of seat pan. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16 1/2"-20". Select guest chairs that are compatible in style, finish and color with the desk chairs.

1.11.3. Conference Room Seating

At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allows seating to be moved up closely to the table top. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish and color with conference seating at the tables.

1.11.4. Lounge, Waiting and Reception Area Seating

Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted.

1.11.5. Break Room Seating

Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required. Chairs shall have metal legs and composite materials for seats.

1.11.6. Lounge, Waiting and Reception Furniture.

Design for end and coffee tables with plastic laminate tops that are compatible in style finish and color with the seating.

1.12. FILING AND STORAGE.

Select storage and shelving units that meet customer's functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy duty storage and shelving if information is not available.

1.13. TRAINING TABLES.

Don't use plastic laminate self edge. Training tables shall be reconfigurable, moveable and storable; lighter weight folding with dollies or casters as necessary. Specify dollies if required.

1.14. FURNITURE WARRANTIES.

Specify manufacturer's performance guarantees or warranties that include parts, labor and transportation as follows:

Furniture System, unless otherwise noted – 10 year minimum
 Furniture System Task Lights – 2 year minimum, excluding bulbs
 Furniture System Fabric – 3 year minimum
 Desks - 10 year minimum
 Seating, unless otherwise noted - 10 year minimum
 Seating Mechanisms and Pneumatic Cylinders - 10 years
 Fabric - 3 years minimum
 Filing and Storage - 10 year minimum
 Tables, unless otherwise noted - 10 year minimum
 Table Mechanisms – 5 year
 Table Ganging Device - 1 year
 Items not listed above - 1 year minimum

ATTACHMENT C

TRACKING COMMENTS IN DRCHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.

2.1. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.

2.2. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.

2.3. Comments that, in the DB Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The DB Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at <http://www.projnet.org> and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Role

The Contractor is the technical reviewer and the Government is the compliance reviewer of the DB designers design documents. Each reviewer enters their own comments into the Dr Checks system. To enter comments:

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

4.3. Click on the appropriate review conference. An Add comment screen will appear.

4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.

4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.

4.6. Once comments are all entered, exit DrChecks by choosing “My Account” and then Logout.

5.0 DrChecks Comment Evaluation

The role of the designers of record is to evaluate and respond to the comments entered by the Government reviewers and by the DB Contractor. To respond to comments:

5.1. Log into DrChecks.

5.2. Click on the appropriate project.

5.3. Under “Evaluate” click on the number under “Pending”.

5.4. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)

5.5. Select the appropriate evaluation (concur, non-concur, for information only, or check and resolve) and add the response.

5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.

5.7. Once evaluations are all entered, exit DrChecks by choosing “My Account” and then Logout.

6.0 DrChecks Back-check

At the following design conference, participants will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and completed. The Contractor and Government reviewers shall either enter additional back-check comments, as necessary or close those that are resolved as a result of the design conferences:

6.1. Log into DrChecks.

6.2. Click on the appropriate project.

6.3. Under “My Backcheck” click on the number under “Pending”.

6.4. If you agree with the designer's response select “Close Comment” and add a closing response if desired.

6.5. If you do not agree with the designer's response or the submittal does not reflect the response given, select “Issue Open”, enter additional information.

6.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

6.7. Once back-checks are all entered, exit DrChecks by choosing “My Account” and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

ATTACHMENT D
SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

Instructions: Use the information outlined in this document to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for all building projects. Additional and supplemental information may be used to further develop the code review. Insert N/A after criteria, which may be "not applicable".

1.0 SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

- 1.1. Project Name (insert name and location)
- 1.2. Applicable Codes and Standards
 - 1.2.1. Unified Facilities Criteria (UFC): 3-600-01, Design: Fire Protection Engineering For Facilities
 - 1.2.2. International Building Code (IBC) for fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements, except as modified by UFC 3-600-01.
 - 1.2.3. National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition), for building egress and life safety and applicable criteria in UFC 3-600-01.
 - 1.2.4. ADA and ABA Accessibility Guidelines. For Buildings and Facilities See Section 01 10 00, Paragraph 3 for facility specific criteria.
- 1.3. Occupancy Classification
IBC chapters 3 and 4
- 1.4. Construction Type
IBC chapter 6
- 1.5. Area Limitations
IBC chapter 5, table 503
- 1.6. Allowable Floor Areas
IBC section 503, 505
- 1.7. Allowable area increases
IBC section 506, 507
- 1.8. Maximum Height of Buildings
IBC section 504
- 1.9. Fire-resistive substitution
- 1.10. Occupancy Separations
IBC table 302.3.2
- 1.11. Fire Resistive Requirements
 - 1.11.1. Exterior Walls - [] hour rating, IBC table 601, 602
 - 1.11.2. Interior Bearing walls - [] hour rating
 - 1.11.3. Structural frame - [] hour rating
 - 1.11.4. Permanent partitions - [] hour rating

- 1.11.5. Shaft enclosures - [] hour rating
- 1.11.6. Floors & Floor-Ceilings - [] hour rating
- 1.11.7. Roofs and Roof Ceilings - [] hour rating
- 1.12. Automatic Sprinklers and others used to determine the need for automatic Extinguishing Equipment, Extinguishing Systems, Foam Systems, Standpipe
 - 1.12.1. UFC 3-600-01, chapters 4 and 6 systems, wet chemical systems, etc. State which systems are required and to what criteria they will be designed.
 - 1.12.2. UFC 3-600-01, Appendix B Occupancy Classification. Note the classification for each room. This may be accomplished by classifying the entire building and noting exceptions for rooms that differ (E.g. The entire building is Light Hazard except boiler room and storage rooms which are [], etc.)
 - 1.12.3. UFC 3-600-01, Chapter 3 Sprinkler Design Density, Sprinkler Design Area, Water Demand for Hose Streams (supply pressure and source requirements).
 - 1.12.4. UFC 3-600-01, Chapter 4 Coverage per sprinkler head. Extended coverage sprinkler heads are not permitted.
 - 1.12.5. Available Water Supply. Provide the results of the water flow tests showing the available water supply static pressure and residual pressure at flow. Based on this data and the estimated flow and pressure required for the sprinkler system, determine the need for a fire pump.
 - 1.12.6. NFPA 13, Para. 8.16.4.6.1. Provide backflow preventer valves as required by the local municipality, authority, or water purveyor. Provide a test valve located downstream of the backflow preventer for flow testing the backflow preventer at full system demand flow. Route the discharge to an appropriate location outside the building.
- 1.13. Kitchen Cooking Exhaust Equipment
Describe when kitchen cooking exhaust equipment is provided for the project. Type of extinguishing systems for the equipment should be provided. per NFPA 96. Show all interlocks with manual release switches, fuel shutoff valves, electrical shunt trips, exhaust fans, and building alarms.
- 1.14. Portable Fire Extinguishers, fire classification and travel distance. per NFPA 10
- 1.15. Enclosure Protection and Penetration Requirements. - Opening Protectives and Through Penetrations
 - 1.15.1. IBC Section 712, 715 and Table 715.3. Mechanical rooms, exit stairways, storage rooms, janitor [] hour rating. IBC Table 302.1.1
 - 1.15.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives
- 1.16. Fire Dampers. Describe where fire dampers and smoke dampers are to be used (IBC Section 716 and NFPA 90A). State whether isolation smoke dampers are required at the air handler.
- 1.17. Detection Alarm and Communication. UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72
- 1.18. Mass Notification. Describe building/facility mass notification system (UFC 4-021-01) type and type of base-wide mass notification/communication system. State whether the visible notification appliances will be combined with the fire alarm system or kept separate. (Note: Navy has taken position to combine visible notification appliances with fire alarm).
- 1.19. Interior Finishes (classification). NFPA 101.10.2.3 and NFPA 101.7.1.4
- 1.20. Means of Egress

- 1.20.1. Separation of Means of Egress, NFPA 101 chapters 7 and 12-42; NFPA101.7.1.3
- 1.20.2. Occupant Load, NFPA101.7.3.1 and chapters 12-42.
- 1.20.3. Egress Capacity (stairs, corridors, ramps and doors) NFPA101.7.3.3
- 1.20.4. Number of Means of Egress, NFPA101.7.4 and chapters 12-42.
- 1.20.5. Dead end limits and Common Path of Travel, NFPA 101.7.5.1.6 and chapters 12-42.
- 1.20.6. Accessible Means of Egress (for accessible buildings), NFPA101.7.5.4
- 1.20.7. Measurement of Travel Distance to Exits, NFPA101.7.6 and chapters 12-42.
- 1.20.8. Discharge from Exits, NFPA101.7.7.2
- 1.20.9. Illumination of Means of Egress, NFPA101.7.8
- 1.20.10. Emergency Lighting, NFPA101.7.9
- 1.20.11. Marking of Means of Egress, NFPA101.7.10
- 1.21. Elevators, UFC 3-600-01, Chapter 6; IBC and ASME A17.1 - 2000,(Safety Code for Elevators and Escalators)
- 1.22. Accessibility Requirements, ADA and ABA Accessibility Guidelines for Buildings and Facilities
- 1.23. Certification of Fire Protection and Life Safety Code Requirements. (Note: Edit the Fire team membership if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features for this project in accordance with the attached completed form(s).
- 1.24. Designer of Record. Certification of Fire protection and Life Safety Code Requirements. (Note: Edit the Fire team members if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features of this project.

Fire Protection Engineer of Record:

Signature and Stamp

Date

OR

Architect of Record:

Signature and Stamp

Date

Mechanical Engineer of Record:

Signature and Stamp

Date

Electrical Engineer of Record:

Signature/Date

ATTACHMENT E
LEED SUBMITTALS

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR	FEATURE	DUE AT			DATE	REV
GENERAL						
	GENERAL - All calculations shall be in accordance with LEED 2.2 Reference Guide.					
	GENERAL: Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb/EngineeringCriteria . OCT09REV					
	GENERAL - For all credits, narrative/comments may be added to describe special circumstances or considerations regarding the project's credit approach.					
	GENERAL - Include all required LEED drawings indicated below in contract drawings with applicable discipline drawings, labeled For Reference Only.					
	NOTE: Each submittal indicated with "****" differs from LEED certified project submittals by either having a different due date or being an added submittal not required by GBCI. OCT09REV					
	OCT09REV GENERAL - Audit documentation may include but is not limited to what is indicated in this table.					
			Closeout	List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals. - OR - Statement confirming that no changes have been made since final design that effect final design submittal documents.		Proj Engr (PE)
CATEGORY 1 - SUSTAINABLE SITES						
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	**Final Design		List of drawings and specifications that address the erosion control, particulate/dust control and sedimentation control measures to be implemented.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		**Final Design		Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
SS1	Site Selection	Final Design		Statement confirming that project does not meet any of the prohibited criteria.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design	X	LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		CIV
SS2	Development Density & Community Connectivity	Final Design		Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius.		CIV
		Final Design		Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV
		Final Design		Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan.		CIV
SS3	Brownfield Redevelopment	Final Design		Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS4.1	Alternative Transportation: Public Transportation Access	Final Design		Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
		Final Design		Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design		FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		CIV
		Final Design		List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		CIV
		Final Design		List of drawings that show the location(s) of shower/changing facilities and, if located outside the building, statement indicating distance from building entrance.		ARC
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Final Design		Statement indicating which option for compliance applies. FTE calculation. Statement indicating total parking capacity of site.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV

Wednesday, November 10, 2010

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
			Final Design	Option 1: List of drawings and specification references that show location and number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
			Final Design	Option 1: Statement indicating quantity, make, model and manufacturer of low-emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
			Final Design	Option 2: Low-emission & fuel-efficient vehicle parking calculation.		CIV
			Final Design	Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
			Final Design	Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period.		CIV
			Closeout	Option 3: Construction product submittals indicating what was provided and confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
SS4.4		Alternative Transportation: Parking Capacity	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		CIV
			Final Design	Option 2: FTE calculation. Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		CIV
			Final Design	Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Narrative indicating number of spaces required and provided and describing infrastructure and support programs with description of project features to support them.		CIV
SS5.1		Site Development: Protect or Restore Habitat	**Final Design	Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each.		CIV
			**Final Design	Option 2: Percentage calculation of restored/preserved habitat to total site area. List of drawings and specification references that convey restoration planting requirements.		CIV
SS5.2		Site Development: Maximize Open Space	Final Design	Option 2: LEED site plan drawing delineating boundary of vegetated open space adjacent to building with areas of building footprint and designated open space noted.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS6.1		Stormwater Design: Quantity Control	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be implemented to prevent excessive stream velocities and erosion.		CIV
			Final Design	Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		CIV
SS6.2		Stormwater Design: Quality Control	Final Design	For non-structural controls, list all BMPs used and, for each, describe the function of the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall treated.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.1		Heat Island Effect: Non-Roof	**Final Design	LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage of reflective/shaded/open grid area.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.2		Heat Island Effect: Roof	Final Design	Option 1: Percentage calculation indicating percentage of SRI compliant roof area. List of drawings and specification references that convey SRI requirements and roof slopes.		ARC

Wednesday, November 10, 2010

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
			Final Design OCT09REV	Option 1: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		ARC
			**Closeout OCT09REV	Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 1: Manufacturer published product data or certification confirming SRI		PE
			Final Design	Option 2: Percentage calculation indicating percentage of vegetated roof area.		ARC
			Final Design	Option 3: Combined reflective and green roof calculation.		ARC
			Final Design OCT09REV	Option 3: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		
			**Closeout OCT09REV	Option 3: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 3: Manufacturer published product data or certification confirming SRI		PE
SS8		Light Pollution Reduction	Final Design	Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interior fixtures does not intersect non-opaque building envelope surfaces). - OR - List of drawings and specification references that show automatic lighting controls that turn off non-essential lighting during non-business hours		ELEC
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC
			Final Design	Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building facade/landscape lighting).		ELEC
			Final Design	Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			Final Design	Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.		ELEC
			Final Design	Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design	Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design	Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
CATEGORY 2 – WATER EFFICIENCY						
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design	List of landscape plan drawings.		CIV
			Final Design	Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used, specific information about source and available quantity.		CIV
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1	Same as WE1.1		CIV
WE2		Innovative Wastewater Technologies	Final Design	Statement confirming which option for compliance applies.		MEC

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			Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design	Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design	Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design	Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site.		MEC
			Final Design	Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		CIV
			Final Design	Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources.		CIV
			Final Design	Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage conveyance reduction.		MEC
			Final Design	Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated wastewater usage.		MEC
WE3.1		Water Use Reduction: 20% Reduction	Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Closeout	X Manufacturer published product data or certification confirming fixture water usage.		PE
WE3.2		Water Use Reduction: 30% Reduction	Same as WE3.1	Same as WE3.1		MEC
CATEGORY 3 – ENERGY AND ATMOSPHERE						
EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design	**Owner's Project Requirements document		ALL
			**Final Design	**Basis of Design document for commissioned systems		MEC, ELEC
			**Final Design	**Commissioning Plan		MEC, ELEC

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			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout	Commissioning Report		PE
EAPR2		Minimum Energy Performance (PREREQUISITE)	Final Design	Statement listing the mandatory provisions of ASHRAE 90.1 that project meets relative to compliance with this prerequisite and indicating which compliance path was used.		MEC ELEC ARC
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies.		MEC
			Final Design	Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		MEC
EA1		Optimize Energy Performance	Final Design	Statement indicating which compliance path option applies.		MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EA2.1		On-Site Renewable Energy	Final Design	Statement indicating which compliance path option applies.		ELEC
			Final Design	List all on-site renewable energy sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost. Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.		ELEC MEC
			Final Design	Option 1: Indicate, for renewable energy, proposed design total annual energy generated and annual cost.		ELEC MEC
			Final Design	Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost, annual electric energy use and cost, annual non-electric fuel use and cost.		ELEC MEC
			Final Design	Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.		ELEC MEC
EA2.2		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA2.3		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA3		Enhanced Commissioning	**Final Design	**Owner's Project Requirements document (OPR)		ALL
			**Final Design	**Basis of Design document for commissioned systems (BOD)		ELEC MEC
			**Final Design	**Commissioning Plan		ELEC MEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout	**Commissioning Report		PE
			**Final Design	Statement by CxA confirming Commissioning Design Review		
			Closeout	Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD		PE
			Closeout	**Systems Manual		PE
			Closeout	Statement by CxA confirming completion of O&M staff and occupant training		PE
			Closeout	**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		PE
			**Predesign	Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		MEC
EA4		Enhanced Refrigerant Management	Final Design	Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2.2 Reference Guide Example Calculations		MEC
			Final Design	Narrative describing any special circumstances or explanatory remarks OCT09REV		
			Closeout	X Cut sheets highlighting refrigerant data for all HVAC components.		PE
EA5		Measurement & Verification	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Measurement and Verification Plan		PE
			Closeout	**Scope of work for post-occupancy implementation of M&V plan		PE
EA6		Green Power	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Option 1: Indicate proposed design total annual electric energy usage		PE
			Closeout	Option 2: Indicate actual total annual electric energy usage		PE
			Closeout	Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use		PE

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			Closeout	Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power		PE
			Closeout	Narrative describing how Green Power or Green Tags are purchased		PE
CATEGORY 4 – MATERIALS AND RESOURCES						
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design	Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MR1.1		Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		ARC
MR1.2		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 50% of Interior Non-Structural Elements	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		ARC
MR2.1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction	Waste Management Plan		PE
			**Construction Quarterly and Closeout	Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
				OCT09REV		
			**Construction Quarterly and Closeout	Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1	Same as MR2.1		PE
MR3.1		Materials Reuse: 5%	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10%	Same as MR3.1	Same as MR3.1		PE
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, pre-consumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	X Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1	Same as MR4.1		PE
MR5.1		Regional Materials: 10% Extracted, Processed & Manufactured Regionally	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance, manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
			Preconstruction OCT09REV	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	X Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

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MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1	Same as MR5.1	PE
MR6		Rapidly Renewable Materials	Closeout	Statement indicating total materials value and whether default or actual.	PE
			Closeout	Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.	PE
			Final Design OCT09REV	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV	ARC
			Closeout X	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet	PE
MR7		Certified Wood	Closeout	Statement indicating total materials value and whether default or actual.	PE
			Closeout	Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.	PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV	PE
			Closeout X	Vendor invoices, FSC chain of custody certificates and manufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.	PE
CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY					
EQPR1		Minimum IAQ Performance (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.	MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.	MEC
EQPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.	ARC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).	ARC
EQ1		Outdoor Air Delivery Monitoring	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.	MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.	MEC
			Final Design	Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.	MEC
			Closeout X	Cut sheets for CO2 monitoring system.	PE
EQ2		Increased Ventilation	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.	MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.	MEC
			Final Design	Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.	MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.	MEC
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction	Construction IAQ Management Plan	PE
			Closeout	Statement confirming whether air handling units were operated during construction	PE
			Closeout	Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.	PE
			Closeout	Spreadsheet indicating, for each filter installed during construction, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.	PE
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction	Construction IAQ Management Plan	PE

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			Closeout	Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements.		PE
			Closeout	Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 1b: Narrative describing the project's pre-occupancy and post-occupancy flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 2: Narrative describing the project's IAQ testing process, including specifics about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout	Option 2: IAQ testing report demonstrating compliance.		PE
EQ4.1		Low Emitting Materials: Adhesives & Sealants	Closeout	Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor aerosol adhesives were used for the project.		PE
			Closeout	X Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.2		Low Emitting Materials: Paints & Coatings	Closeout	Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor anti-corrosive/anti-rust paints were used for the project .		PE
			Closeout	X Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.3		Low Emitting Materials: Carpet Systems	Closeout	Spreadsheet indicating, for each indoor carpet used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		PE
			Closeout	Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data - OR - Statement confirming no indoor carpet cushion was used for the project.		PE
			Closeout	X Manufacturer published product data or certification confirming material CRI label in spreadsheet		PE
EQ4.4		Low Emitting Materials: Composite Wood & Agrifiber Products	Closeout	Spreadsheet indicating, for each indoor composite wood and agrifiber product used, the manufacturer, product name/model number, if it contains added urea formaldehyde (yes/no) and source of LEED compliance data.		PE
			Closeout	X Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		PE
EQ5		Indoor Chemical & Pollutant Source Control	Closeout OCT09REV	Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system. Roll-up and carpet systems requiring weekly cleaning to earn this credit are not a permitted option for Army projects.		PE
			Final Design	List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			Final Design	Spreadsheet indicating, for each chemical use area, the room number, room name, description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming that project includes no chemical use areas and that no hazardous cleaning materials are needed for building maintenance.		ARC MEC
			Final Design	If project includes chemical use areas: List of drawing and specification references that convey locations of chemical use areas, room separation features and exhaust system.		ARC MEC
			Closeout OCT09REV	If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.		PE

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EQ6.1		Controllability of Systems: Lighting	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.		ELEC
			Final Design	For each shared multi-occupant space, provide a brief description of lighting controls.		ELEC
			Final Design	Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.		ELEC
EQ6.2		Controllability of Systems: Thermal Comfort	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with individual thermal comfort controls.		MEC
			Final Design	For each shared multi-occupant space, provide a brief description of thermal comfort controls.		MEC
			Final Design	Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.		MEC
EQ7.1		Thermal Comfort: Design	Final Design	Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and maximum indoor space design humidity.		MEC
			Final Design	Narrative describing method used to establish thermal comfort control conditions and how systems design addresses the design criteria, including compliance with the referenced standard.		MEC
EQ7.2		Thermal Comfort: Verification	Final Design	Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		MEC
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design	Option 1: Table indicating all regularly occupied spaces with space area and space area with 2% daylighting factor. Sum of regularly occupied areas and regularly occupied areas with 2% daylighting factor. Percentage calculation of areas with 2% daylighting factor to total regularly occupied areas.		ARC
			Final Design	Option 1: Glazing factor calculation table		ARC
			Final Design	Option 2: Simulation model method, software and output data		ARC
			Final Design	Option 2: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.		ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	List of drawing and specification references that convey exterior glazed opening head and sill heights and glazing performance properties.		ARC
			Closeout	Manufacturer published product data or certification confirming glazing Tvis in spreadsheet		PE
EQ8.2		Daylight & Views: Views for 90% of Spaces	Final Design	Table indicating all regularly occupied spaces with space area and space area with access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.		ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey exterior glazed opening head and sill heights.		ARC
CATEGORY 6 – FACILITY DELIVERY PROCESS						
IDc1.1		Innovation in Design	Final Design OCT09REV	Narrative describing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
IDc1.2		Innovation in Design	Final Design OCT09REV			
IDc1.3		Innovation in Design	Final Design OCT09REV			
IDc1.4		Innovation in Design	Final Design OCT09REV			
IDc2		LEED Accredited Professional	Final Design	Narrative indicating name of LEED AP, company name of LEED AP, description of LEED AP's role and responsibilities in the project.		ARC

ATTACHMENT F
Version 07-07-2010**BUILDING INFORMATION MODELING REQUIREMENTS****1.0 Section 1 - Submittal Format**

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be Arch D size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. For each Center of Standardization (CoS) facility type included in this project, all BIM Models and associated Facility Data shall be submitted in Bentley Systems BIM [Not Supplied - SubmittalReqCADDSystem : BENTLEY_VERSION] with associated USACE Bentley BIM Workspace (which includes specific standard BIM libraries and definitions). This Workspace can be downloaded from the CAD/BIM Technology Center. [Where available, the workspace will be specific to this CoS Facility Standard Design. The Contractor will be provided a baseline multi-discipline BIM Project Model for the CoS Facility Standard Design type, where such a model exists (for the purposes of site adaptation).] The USACE Bentley BIM Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included with the USACE BIM Workspace are permitted to be used.

2.1.1. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.2. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE [Not Supplied - DistrictInfoGeneral : ISSUING_DISTRICT] District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2.1. IFC Support. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class - see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall be fully interoperable, compatible, and editable with the Bentley BIM tools. Use the specified version of the USACE Bentley BIM Workspace and conform to the requirements of **Sections 3 and 4 below**.

2.2.3. BIM Project Execution Plan.

2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.

2.2.4. BIM Requirements..

2.2.4.1. Facility Data. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

2.2.4.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.4.3. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.2.4.4. Output. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Model Standards Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.

2.3.2. CAD Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

2.4.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.

3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:

- The Model, Facility Data, Workspace and CAD Data files in native Bentley BIM/CAD.
- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.

- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

3.1.4. The Government will confirm acceptability of all submittals identified in Section 3 in coordination with the USACE [Not Supplied - DistrictInfoGeneral : ISSUING_DISTRICT] BIM Manager

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.

3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Built BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

- 4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.
- 4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.
- 4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.
- 4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.
- 4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.
- 4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.
- 4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.
- 4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.
- 4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.
- 4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.
- 4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:
- 4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations
- 4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:

4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.

4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.

4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.

4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:

4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding Systems. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.

6.3.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.

6.4. Cost Estimating. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken down by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.

ATTACHMENT G**DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT**

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	

SECTION 01 45 01.10
QUALITY CONTROL SYSTEM (QCS)

1.0 GENERAL

- 1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS
- 1.2. QCS SOFTWARE
- 1.3. SYSTEM REQUIREMENTS
- 1.4. RELATED INFORMATION
- 1.5. CONTRACT DATABASE
- 1.6. DATABASE MAINTENANCE
- 1.7. IMPLEMENTATION
- 1.8. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM
- 1.9. MONTHLY COORDINATION MEETING
- 1.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Import/Export of Data
- Request for Information
- Accident Reporting
- Safety Exposure Manhours

1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS

For ease and speed of communications, both Government and Contractor will exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2. OTHER FACTORS

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10, PROJECT SCHEDULE, Section 01 33 00, SUBMITTAL PROCEDURES, and Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.3. QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.4. SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

(a) Hardware

- IBM-compatible PC with 1000 MHz Pentium or higher processor
- 256 MB RAM for workstation / 512+ MB RAM for server
- 1 GB hard drive disk space for sole use by the QCS system
- Compact disk (CD) Reader, 8x speed or higher
- SVGA or higher resolution monitor (1024 x 768, 256 colors)
- Mouse or other pointing device
- Windows compatible printer (Laser printer must have 4+ MB of RAM)
- Connection to the Internet, minimum 56K BPS

(b) Software

- MS Windows 2000 or higher
- MS Word 2000 or newer
- Latest version of : Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher
- Electronic mail (E-mail), MAPI compatible
- Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.5. RELATED INFORMATION

1.5.1. QCS USER GUIDE

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.5.2. CONTRACTOR QUALITY CONTROL (CQC) TRAINING

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.6. CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by using the government's SFTP repository built into QCS import/export function. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.7. DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government, e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc. shall be submitted using the government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, email or CD-ROM may be used instead (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically shall include current data on the following items:

1.7.1. ADMINISTRATION

1.7.1.1. Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format.

1.7.1.2. Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format.

1.7.1.3. Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main)

office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

All Requests For Information (RFI) shall be exchanged using the Built-in RFI generator and tracker in QCS.

1.7.1.4. Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.5. Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.7.2. FINANCES

1.7.2.1. Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the design and construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.7.2.2. Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet prompt payment certification, and payment invoice in QCS. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment request, prompt payment certification, and payment invoice with supporting data by using the government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, E-mail or a CD-ROM may be used. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.7.3. Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a QCS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.7.3.1. Daily Contractor Quality Control (CQC) Reports

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government within 24 hours after the date covered by the report. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.7.3.2. Deficiency Tracking

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.7.3.3. QC Requirements

The Contractor shall develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.7.3.4. Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.7.3.5. Labor and Equipment Hours

The Contractor shall log labor and equipment exposure hours on a daily basis. This data will be rolled up into a monthly exposure report.

1.7.3.6. Accident/Safety Tracking Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This supplemental entry is not to be considered as a substitute for completion of mandatory notification and reports, e.g., ENG Form 3394 and OSHA Form 300.

1.7.3.7. Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.7.3.8. Hazard Analysis

The Contractor shall use QCS to develop a hazard analysis for each feature of work included in its CQC Plan. The hazard analysis shall address any hazards, or potential hazards, that may be associated with the work

1.7.4. Submittal Management

The Government will provide the submittal register form, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. The Contractor and Designer of Record (DOR) shall develop and maintain a complete list of all submittals, including completion of all data columns and shall manage all submittals. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. QCS and RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.7.5. Schedule

The Contractor shall develop a design and construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.7.5.1. Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.8. IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.9. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of QCS data is by using the government's SFTP repository built into QCS export function.. Other data should be submitted using E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of CD-ROM for data transfer. Data on CDs shall be exported using the QCS built-in export function. If used, CD-ROMs will be submitted in accordance with the following:

1.9.1. File Medium

The Contractor shall submit required data on CD-ROMs. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.9.2. Disk Or Cd-Rom Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.9.3. File Names

The files will be automatically named by the QCS software. The naming convention established by the QCS software shall not be altered in any way by the Contractor.

1.10. MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.

The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.11. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

End of Section 01 45 01.10

SECTION 01 45 04.00 10
CONTRACTOR QUALITY CONTROL

1.0 GENERAL

1.1. REFERENCES

1.2. PAYMENT

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. QUALITY CONTROL PLAN

3.3. COORDINATION MEETING

3.4. QUALITY CONTROL ORGANIZATION

3.5. SUBMITTALS AND DELIVERABLES

3.6. CONTROL

3.7. TESTS

3.8. COMPLETION INSPECTION

3.9. DOCUMENTATION

3.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL**1.1. REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies
Engaged in the Testing and/or Inspection
of Soil and Rock as Used in Engineering
Design and Construction
- ASTM E 329 Agencies Engaged in the Testing
and/or Inspection of Materials Used in
Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)
ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)**3.0 EXECUTION****3.1. GENERAL REQUIREMENTS**

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.

3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.

3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.

3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.

3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

3.2.1.8. Reporting procedures, including proposed reporting formats.

3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.

3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for

errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.

3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. . The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System

Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

3.4.3. CQC Personnel

3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.

3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; **are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility**; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. **One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:**

3.4.4. Experience Matrix

3.4.4.1. Area Qualifications

3.4.4.1.1. Civil - Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.

3.4.4.1.2. Mechanical - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.

3.4.4.1.3. Electrical - Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.

3.4.4.1.4. Structural - Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.

3.4.4.1.5. Plumbing - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.

3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area

3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).

3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)

3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).

3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at [Not Supplied - ConstructionReqQC : COURSE_LOCATION]. Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 **SUBMITTAL PROCEDURES**. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.

3.6.1.2. A review of the contract drawings.

3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.6.1.10. Discussion of the initial control phase.

3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4. Resolve all differences.

3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.

3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.

3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government

duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.

3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3. Check test instrument calibration data against certified standards.

3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2. Testing Laboratories

3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of \$1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

- For delivery by mail:
 - [Not Supplied - ConstructionReqQC : LAB_NAME]
 - [Not Supplied - ConstructionReqQC : LAB_ATTN]
 - [Not Supplied - ConstructionReqQC : LAB_MAIL]
 - [Not Supplied - ConstructionReqQC : LAB_STATE]
- For other deliveries:
 - [Not Supplied - ConstructionReqQC : LAB_NAME_OTHER]

[Not Supplied - ConstructionReqQC : LAB_ATTEN_OTHER]

[Not Supplied - ConstructionReqQC : LAB_MAIL_OTHER]

[Not Supplied - ConstructionReqQC : LAB_STATE_OTHER]

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:

3.9.1.1. Contractor/subcontractor and their area of responsibility.

3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.

3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

- 3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.
- 3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- 3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- 3.9.1.7. Offsite surveillance activities, including actions taken.
- 3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- 3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.
- 3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.
- 3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

**SECTION 01 50 02
TEMPORARY CONSTRUCTION FACILITIES**

1.0 OVERVIEW

- 1.1. GENERAL REQUIREMENTS
- 1.2. AVAILABILITY AND USE OF UTILITY SERVICES
- 1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN
- 1.4. PROTECTION AND MAINTENANCE OF TRAFFIC
- 1.5. MAINTENANCE OF CONSTRUCTION SITE
- 1.6. GOVERNMENT FIELD OFFICE

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. Site Plan

Prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Also indicate if the use of a supplemental or other staging area is desired.

1.2. AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1. See Section 00 72 00, Contract Clauses and Section 00 73 00, Special Contract Requirements, for Utility Availability requirements.

1.2.2. Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

1.2.3. Telephone

Make arrangements and pay all costs for desired telephone facilities.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board

Immediately upon beginning of onsite work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Display legible copies of the aforementioned data until work is completed. Remove the bulletin board from the site upon completion of the project.

1.3.2. Project and Safety Signs

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try <http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf>.

1.4. PROTECTION AND MAINTENANCE OF TRAFFIC

Provide access and temporary relocated roads as necessary to maintain traffic. Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Take measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property.

The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. Investigate the adequacy of existing roads and the allowable load limit on these roads. Repair any damage to roads caused by construction operations.

1.4.1. Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Construct haul roads with suitable grades and widths. Avoid sharp curves, blind corners, and dangerous cross traffic. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Provide adequate lighting to assure full and clear visibility for full width of haul road and work areas during any night work operations. Remove haul roads designated by the Contracting Officer upon completion of the work and restore those areas.

1.4.2. Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.5. MAINTENANCE OF CONSTRUCTION SITE

Mow grass and vegetation located within the boundaries of the construction site for the duration of the project, from NTP to contract completion. Edge or neatly trim grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers from NTP to contract completion.

1.6. GOVERNMENT FIELD OFFICE

1.6.1. Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 800 square feet in floor area, co-located on the project site with the Contractor's office and providing space heat, air conditioning, electric light and power, power and communications outlets and toilet facilities consisting of at least one lavatory and at least one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide outlets for 2 government phones and same number of LAN connections for Government computers. Coordinate with the Resident Engineer for locations. Provide a conference room with space large enough for 7 personnel to hold meetings. Provide a minimum of two outlets per government work station and at least one outlet per 10 feet of wall space for other government equipment. Provide at least twice weekly janitorial service. Remove the office facilities upon completion of the work and restore those areas. Connect and disconnect utilities in accordance with local codes and to the satisfaction of the Contracting Officer.

1.6.2. Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds, per EM 385-1-1.

End of Section 01 50 02

SECTION 01 57 20.00 10
ENVIRONMENTAL PROTECTION

1.0 GENERAL REQUIREMENTS

- 1.1. SUBCONTRACTORS
- 1.2. ENVIRONMENTAL PROTECTION PLAN
- 1.3. PROTECTION FEATURES
- 1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS
- 1.5. NOTIFICATION

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

- 3.1. LAND RESOURCES
- 3.2. WATER RESOURCES
- 3.3. AIR RESOURCES
- 3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL
- 3.5. RECYCLING AND WASTE MINIMIZATION
- 3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES
- 3.7. BIOLOGICAL RESOURCES
- 3.8. INTEGRATED PEST MANAGEMENT
- 3.9. PREVIOUSLY USED EQUIPMENT
- 3.10. MILITARY MUNITIONS
- 3.11. TRAINING OF CONTRACTOR PERSONNEL
- 3.12. POST CONSTRUCTION CLEANUP

1.0 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations

1.1. SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.2. ENVIRONMENTAL PROTECTION PLAN

1.2.1. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Define issues of concern within the Environmental Protection Plan as outlined in this section. Address each topic in the plan at a level of detail commensurate with the environmental issue and required construction task(s). Identify and discuss topics or issues which are not identified in this section, but which the Contractor considers necessary, after those items formally identified in this section. Prior to commencing construction activities or delivery of materials to the site, submit the Plan for review and Government approval. The Contractor shall meet with the Government prior to implementation of the Environmental Protection Plan, for the purpose of discussing the implementation of the initial plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. Maintain and keep the Environmental Protection Plan current onsite.

1.2.2. Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.2.3. Contents

The plan shall include, but shall not be limited to, the following:

1.2.3.1. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

1.2.3.2. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable

1.2.3.3. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel

1.2.3.4. Description of the Contractor's environmental protection personnel training program

1.2.3.5. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. Include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

1.2.3.6. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site

1.2.3.7. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

1.2.3.8. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

1.2.3.9. Drawing showing the location of on-installation borrow areas.

1.2.3.10. A spill control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The spill control plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

- (a) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Government and the local Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.
- (b) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup
- (c) Training requirements for Contractor's personnel and methods of accomplishing the training
- (d) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.
- (e) The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency
- (f) The methods and procedures to be used for expeditious contaminant cleanup

1.2.3.11. A solid waste management plan identifying waste minimization, collection, and disposals methods, waste streams (type and quantity), and locations for solid waste diversion/disposal including clearing debris and C&D waste that is diverted (salvaged, reused, or recycled). Detail the contractor's actions to comply with, and to participate in, Federal, state, regional, local government, and installation sponsored recycling programs to reduce the volume of solid waste at the source. Identify any subcontractors responsible for the transportation, salvage and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility. Attach evidence of the facility's ability to accept the solid waste to this plan. A construction and demolition waste management plan, similar to the plan specified in the UFGS 01 74 19 (formerly 01572) may be used as the non-hazardous solid waste management plan. Provide a Non-Hazardous Solid Waste Diversion Report. Submit the report on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and each quarter thereafter (e.g. the first working day of January, April, July, and October) until the end of the project. Additionally, a summary report, with all data fields, is required at the end of the project. The report shall indicate the total type and amount of waste generated, total type and amount of waste diverted, type and amount of waste sent to waste-to-energy facility and alternative daily cover, in tons along with the percent that was diverted. Maintain, track and report construction and demolition waste data in a manner such that the installation can enter the data into the Army SWAR database, which separates data by type of material. A cumulative report in LEED Letter Template format may be used but must be modified to include the date disposed of/diverted and include the above stated diversion data. NOTE: The Solid Waste Diversion Reports are separate documentation than the LEED documentation.

1.2.3.12. DELETED.

1.2.3.13. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

1.2.3.14. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of

these materials. In accordance with EM 385-1-1, include a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time in the contaminant prevention plan. Update the plan as new hazardous materials are brought on site or removed from the site. Reference this plan in the storm water pollution prevention plan, as applicable.

1.2.3.15. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented and any required permits. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, include documentation that the waste water treatment plant Operator has approved the flow rate, volume, and type of discharge.

1.2.3.16. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Government.

1.2.3.17. A pesticide treatment plan, updated, as information becomes available. Include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. Follow AR 200-1, Chapter 5, Pest Management, Section 5-4, "Program Requirements" for data required to be reported to the Installation.

1.3. PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Government shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. Both the Contractor and the Government will sign this survey, upon mutual agreement as to its accuracy and completeness. The Contractor develop a plan that depicts how it will protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Government and may require an extended review, processing, and approval time. The Government reserves the right to disapprove alternate methods, even if they are more cost effective, if the Government determines that the proposed alternate method will have an adverse environmental impact.

1.5. NOTIFICATION

The Government will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Government of the proposed corrective action and take such action when approved by the Government. The Government may issue an order stopping all or part of the

work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Government may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

3.1. LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. Do not attach or fasten any ropes, cables, or guys to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Remove all stone, soil, or other materials displaced into uncleared areas..

3.1.1. Work Area Limits

Prior to commencing construction activities, mark the areas that need not be disturbed under this contract. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. Personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2. Landscape

Clearly identify trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.1.3. Erosion and Sediment Controls

Provide erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. Coordinate with approving authorities (federal, state, etc.) for specific requirements to be included in the plan. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. Keep the area of bare soil exposed at any one time by construction operations to a minimum necessary. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Remove any temporary measures after the area has been stabilized.

3.1.4. Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Government. Make only approved temporary movement or relocation of Contractor facilities. Provide erosion and sediment controls for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant and/or work areas to protect adjacent areas.

3.2. WATER RESOURCES

Monitor construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. Monitor all water areas affected by construction activities. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by state or federally issued Clean Water Act permits.

3.2.1. Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments or impede state-designated flows.

3.2.2. Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3. AIR RESOURCES

Comply with all Federal and State air emission and performance laws and standards for equipment operation, activities, or processes.

3.3.1. Particulates

Control dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods are permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.3.2. Odors

Control odors from construction activities at all times. Odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3. Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the state and Installation rules.

3.3.4. Burning

Burning is not allowed on the project site unless specified in other sections of the specifications or by written authorization. Specific times, locations, and manners of burning shall be subject to approval.

3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.4.1. Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Conduct handling, storage, and disposal to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. The minimum acceptable off-site solid waste disposal option is a Subtitle D RCRA permitted landfill. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.4.2. Chemicals and Chemical Wastes

Dispense chemicals, ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. The Government may periodically review this documentation. Collect chemical waste in corrosion resistant, compatible containers. Monitor and remove collection drums to a staging or storage area when contents are within 6 inches of the top. Classify, manage, store, and dispose of wastes in accordance with Federal, State, and local laws and regulations.

3.4.3. Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable state and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes; protect it from the weather by placing it in a safe covered location and take precautionary measures, such as berming or other appropriate measures, against accidental spillage. Store, describe, package, label, mark, and placard hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, state, and local laws and regulations. Transport Contractor generated hazardous waste off Government property in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Immediately report spills of hazardous or toxic materials to the Government and the Facility Environmental Office. Contractor will be responsible for cleanup and cleanup costs due to spills. Contractor is responsible for the disposition of Contractor generated hazardous waste and excess hazardous materials.

3.4.4. Fuel and Lubricants

Conduct storage, fueling and lubrication of equipment and motor vehicles in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations.

3.5. RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project. Line and berm fueling areas and establish storm water control structures at discharge points for site run-off. Keep a liquid containment clean-up kit available at the fueling area.

3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area are shown on the drawings. Protect and preserve these resources during the life of the Contract. Temporarily suspend all activities that may damage or alter such resources, if any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found during excavation or other construction activities. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, notify the Government so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.7. BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitat. Protect threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.8. INTEGRATED PEST MANAGEMENT

Coordinate, through the Government, with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application, in order to minimize impacts to existing fauna and flora. Discuss

integrated pest management strategies with the IPMC and receive concurrence from the IPMC, through the COR, prior to the application of any pesticide associated with these specifications. Give IMPC personnel the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.8.1. Pesticide Delivery and Storage

Deliver pesticides, approved for use on the Installation, to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

3.8.2. Qualifications

Use the services of a subcontractor for pesticide application whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.8.3. Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions.

3.8.4. Application

A state certified pesticide applicator shall apply pesticides in accordance with EPA label restrictions and recommendations.

3.9. PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.10. MILITARY MUNITIONS

Immediately stop work in that area and immediately inform the Government, in the event military munitions, as defined in 40 CFR 260, are discovered or uncovered.

3.11. TRAINING OF CONTRACTOR PERSONNEL

Train personnel in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. The training and meeting agenda shall include methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.12. POST CONSTRUCTION CLEANUP

Clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade, fill and seed the entire disturbed area, unless otherwise indicated.

SECTION 01 62 35
RECYCLED/RECOVERED MATERIAL

1.0 GENERAL

- 1.1. REFERENCES
- 1.2. OBJECTIVES
- 1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK
- 1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK
- 1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

- U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
- 40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2. OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials, when incorporated into the work under this contract, shall contain at least the minimum percentage of recycled or recovered materials indicated by EPA unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be use by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

End of Section 01 62 35

**SECTION 01 78 02.00 10
CLOSEOUT SUBMITTALS**

1.0 OVERVIEW

- 1.1. SUBMITTALS
- 1.2. PROJECT RECORD DOCUMENTS
- 1.3. EQUIPMENT DATA
- 1.4. CONSTRUCTION WARRANTY MANAGEMENT
- 1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING
- 1.6. OPERATION AND MAINTENANCE MANUALS
- 1.7. FIELD TRAINING
- 1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY
- 1.9. LEED REVIEW MEETINGS
- 1.10. RED ZONE MEETING
- 1.11. FINAL CLEANING
- 1.12. INTERIM FORM DD1354 "TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY"

EXHIBIT 1 SAMPLE RED ZONE MEETING CHECKLIST

1.0 OVERVIEW

1.1. SUBMITTALS

Government approval is required for any submittals with a "G" designation; submittals not having a "G" designation are for Designer of Record approval or for information only. Submit the following in accordance with Section 01 33 00 submittals:

SD-02 Shop Drawings

- As-Built Drawings - G
 - Drawings showing final as-built conditions of the project. Provide electronic drawing files as specified in Section 01 33 16, 3 sets of blue-line prints and one set of the approved working as-built drawings.

SD-03 Product Data

- As-Built Record of Equipment and Materials
 - Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.
- Construction Warranty Management Plan
 - Three sets of the construction warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.
- Warranty Tags
 - Two record copies of the warranty tags showing the layout and design.
- Final Cleaning
 - Two copies of the listing of completed final clean-up items.

1.2. PROJECT RECORD DOCUMENTS

1.2.1. As-Built Drawings – G

An as-built drawing is a construction drawing revised to reflect the final as-built conditions of the project as a result of modifications and corrections to the project design required during construction. The final as-built drawings shall not have the appearance of marked up drawings, but that of professionally prepared drawings as if they were the "as designed" drawings.

1.2.2. Maintenance of As-Built Drawings

1.2.2.1. The Configuration Management Plan shall describe how the Contractor will maintain up-to-date drawings, how it will control and designate revisions to the drawings and specifications (In accordance with Special Contract Requirement: ***Deviating from the Accepted Design*** and Section 01 33 16: ***Design after Award***, the Designer of Record's approval is necessary for any revisions to the accepted design).

1.2.2.2. Make timely updates, carefully maintaining a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the construction drawings. Enter changes and corrections on drawings promptly to reflect "Current Construction". Perform this update no less frequently than weekly for the blue line drawings and update no less frequently than quarterly for the CADD/CAD and BIM files, which were prepared previously in accordance with Section 01 33 16. Include a confirmation that the as-builts are up to date with the submission of the monthly project schedule.

1.2.2.3. If the DB Contractor fails to maintain the as-built drawings as required herein, the Government will retain from the monthly progress payment, an amount representing the estimated monthly cost of maintaining the as-built drawings. Final payment with respect to separately priced facilities or the contract as a whole will be withheld until the Contractor submits acceptable as-built drawings and the Government approves them.

1.2.2.4. The marked-up set of drawings shall reflect any changes, alterations, adjustments or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design.

1.2.2.5. Typically, room numbers shown on the drawings are selected for design convenience and do not represent the actual numbers intended for use by the end user. Final as-built drawings shall reflect actual room numbers adopted by the end user.

1.2.2.6. If there is no separate contract line item (CLIN) for as-built drawings, the Government will withhold the amount of \$35,000, or 1% of the present construction value, whichever is the greater, until the final as-built drawing submittal has been approved by the Government.

1.2.3. Underground Utilities

The drawings shall indicate, in addition to all changes and corrections, the actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Locate Valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Record average elevation of the top of each run or underground structure..

1.2.4. Partial Occupancy

For projects where portions of construction are to be occupied or activated before overall project completion, including portions of utility systems, supply as-built drawings for those portions of the facility being occupied or activated at the time the facility is occupied or activated. Show this same as-built information previously furnished on the final set of as-built drawings.

1.2.5. As-Built Conditions That are Different From the construction Drawings

Accurately reflect all as-built conditions that are different, such as dimensions, road alignments and grades, and drainage and elevations, from the construction drawings on each drawing. If the as-built condition is accurately reflected on a shop drawing, then furnish that shop drawing in CADD format. Reference the final as-built construction drawing the shop drawing file that includes the as-built information. In turn, the shop drawing shall reference the applicable construction as-built drawing. Delete any options shown on drawings and not selected clearly reflect options selected on final as-built drawings.

1.2.6. Additional As-Built Information that Exceeds the Detail Shown on the construction Drawings:

These as-built conditions include those that reflect structural details, foundation layouts, equipment, sizes, mechanical and electrical room layouts and other extensions of design, that were not shown in the project design documents because the exact details were not known until after the time of approved shop drawings. It is recognized that these shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the construction drawings, piping, and equipment drawings. Include locations of all explorations, logs of all explorations, and results of all laboratory testing, including those provided by the Government. Furnish all such shop drawings in CADD /CADformat. Include fire protection details, such as wiring, performed for the design of the project.

1.2.7. Final As-Built Drawings

Submit final as-built CADD/CAD and BIM Model(s) and Facility Data files at the time of Beneficial Occupancy of the project or at a designated phase of the project. In the event the Contractor accomplishes additional work after this submittal, which changes the as-built conditions, submit a new DVD with all drawing sheets and three blue-line copies of affected sheets which depict additional changes.

1.2.8. Title Blocks

In accordance with the configuration management plan, clearly mark title blocks to indicate final as-built drawings.

1.2.9. Other As-Built Documents

Provide scans of all other documents such as design analysis, catalog cuts, certification documents that are not available in native electronic format in an organized manner in Adobe.pdf format.

1.2.9.1. LEED Documentation

Update LEED documentation on at least a monthly basis and have it available for review by the Government on the jobsite at all times during construction. Submit the final LEED Project Checklist(s), final LEED submittals checklist and complete project documentation, verifying the final LEED score and establishing the final rating. Provide full support to the validation review process, including credit audits. See also the LEED documentation requirements in Section 01 33 16, DESIGN AFTER AWARD.

1.2.9.2. GIS Documentation

Provide final geo-referenced GIS database of the new building footprint along with any changes made to exterior of the building. The intent of capturing the final building footprint and exterior modifications in a GIS database is to provide the installation with a data set of the comprehensive changes made to the landscape as a result of the construction project. The Government will incorporate this data set into the installations existing GIS MasterPlan or Enterprise GIS system. The GIS database deliverable shall follow a standard template provided to the Contractor by the Government, adhere to detailed specifications outlined in ECB No 2006-15, and be documented using the Federal Geographic Data Committee (FGDC) metadata standard.

1.3. EQUIPMENT DATA

1.3.1. Real Property Equipment

Provide an Equipment-in-Place list of all installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. Include the cost of each piece of installed property F.O.B. construction site. For each of the items which is specified herein to be guaranteed for a specified period from the date of acceptance thereof, provide the following information: The name, serial and model number address of equipment supplier, or manufacturer originating the guaranteed item. The Contractor's guarantee to the Government of these items will not be limited by the terms of any manufacturer's guarantee to the Contractor. Furnish the list as one (1) reproducible and three (3) copies thirty (30) calendar days before completion of any segment of the contract work which has an incremental completion date.

1.3.2. Maintenance and Parts Data

Furnish a brochure, catalog cut, parts list, manufacturer's data sheet or other publication showing detailed parts data on all other equipment subject to repair and maintenance procedures not otherwise required in Operations and Maintenance Manuals specified elsewhere in this contract. Distribution of directives shall follow the same requirements as listed in paragraph above.

1.3.3. Construction Specifications

Furnish permanent electronic files of final as-built construction specifications, including modifications thereto, with the as-built drawings.

1.4. CONSTRUCTION WARRANTY MANAGEMENT

1.4.1. Prior to the end of the one year warranty, the Government may conduct an infrared roof survey on any project involving a membrane roofing system. This survey will be conducted in accordance with ASTM C1153-90, "Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging". The Contractor shall replace all damaged materials and locate and repair sources of moisture penetration.

1.4.2. Management

1.4.2.1. Warranty Management Plan

Develop a warranty management plan containing information relevant to the clause **Warranty of Construction** in FAR 52.246-21. Submit the warranty management plan for Government approval at least 30 days before the planned pre-warranty conference. In the event of phased turn-over of the contract, update the Warranty Management Plan as necessary to include latest information required. Include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Submit warranty information made available during the construction phase prior to each monthly pay estimate. Assemble information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. The Contractor, Government, including the Customer Representative shall jointly conduct warranty inspections, 4 months and 9 months, after acceptance. The warranty management plan shall include, but shall not be limited to, the following information:

- (1) Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the contractors, subcontractors, manufacturers or suppliers involved.
- (2) Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.
- (3) A list for each warranted equipment, item, feature of construction or system indicating:
 - (i) Name of item.
 - (ii) Model and serial numbers.
 - (iii) Location where installed.
 - (iv) Name and phone numbers of manufacturers or suppliers.
 - (v) Names, addresses and telephone numbers of sources of spare parts.
 - (vi) Warranties and terms of warranty. Include one-year overall warranty of construction. Indicate those items, which have extended warranties with separate warranty expiration dates.
 - (vii) Cross-reference to warranty certificates as applicable.
 - (viii) Starting point and duration of warranty period.
 - (ix) Summary of maintenance procedures required to continue the warranty in force.
 - (x) Cross-reference to specific pertinent Operation and Maintenance manuals.
 - (xi) Organization, names and phone numbers of persons to call for warranty service.
 - (xii) Typical response time and repair time expected for various warranted equipment.
- (4) The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.
- (5) Procedure and status of tagging of all equipment covered by extended warranties.
- (6) Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.4.3. Performance Bond

1.4.3.1. The Contractor's Performance Bond will remain effective throughout the construction warranty period.

1.4.3.2. In the event the Contractor or his designated representative(s) fails to commence and diligently pursue any work required under this clause, and in a manner pursuant to the requirements thereof, the Government shall have

a right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Government shall have the work performed by others, and after completion of the work, may make demand for reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

1.4.3.3. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Government will have the right to recoup expenses from the bonding company.

1.4.3.4. Following oral or written notification of required warranty repair work, the Contractor will respond as dictated by para. 1.4.5. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Government to proceed against the Contractor as outlined in the paragraph 1.4.5.5 and/or above.

1.4.4. Pre-Warranty Conference

Prior to contract completion, or completion of any phase or portion of contract to be turned over, and at a time designated by the Contracting Officer, the Contractor shall meet with the Government to develop a mutual understanding with respect to the requirements of this clause. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Government for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of his responsibilities in connection with other portions of this provision.

1.4.5. Contractor's Response to Warranty Service Requirements.

Following Government oral or written notification, which may include authorized installation maintenance personnel, the Contractor shall respond to warranty service requirements in accordance with the "Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and backcharge the construction warranty payment item established.

1.4.5.1. First Priority Code 1 Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

1.4.5.2. Second Priority Code 2 Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

1.4.5.3. Third Priority Code 3 All other work to be initiated within 3 work days and work continuously to completion or relief.

1.4.5.4. The "Warranty Service Priority List" is as follows:

- Code 1 - Air Conditioning System
 - (a) Buildings with computer equipment.
 - (b) Barracks, mess halls (entire building down).
- Code 2 - Air Conditioning Systems
 - (a) Recreational support.
 - (b) Air conditioning leak in part of building, if causing damage.
 - (c) Air conditioning system not cooling properly

- (d) Admin buildings with Automated Data Processing (ADP) equipment not on priority list.
 - Code 1 - Doors
- (a) Overhead doors not operational.
 - Code 1 - Electrical
- (a) Power failure (entire area or any building operational after 1600 hours).
- (b) Traffic control devices.
- (c) Security lights.
- (d) Smoke detectors and fire alarm systems
- (e) Power or lighting failure to an area, facility, portion of a facility, which may adversely impact health, safety, security, or the installation's mission requirement, or which may result in damage to property.
 - Code 2 - Electrical
- (a) Power failure (no power) for unoccupied buildings or portions thereof or branch circuits within occupied buildings, not listed as Code 1.
- (a) Receptacle and lights, not listed as code 1.
 - Code 3 - Electrical
- (a) Street, parking area lights
 - Code 1 - Gas
- (a) Leaks and breaks.
- (b) No gas to cantonment area.
 - Code 1 - Heat
- (a) Area power failure affecting heat.
- (b) Heater in unit not working.
 - Code 2 Heat
- (a) All heating system failures not listed as Code 1.
 - Code 3 - Interior
- (a) Floor damage
- (b) Paint chipping or peeling
 - Code 1 - Intrusion Detection Systems - N/A.
 - Code 2 - Intrusion Detection Systems other than those listed under Code 1
 - Code 1 - Kitchen Equipment
- (a) Dishwasher.
- (b) All other equipment hampering preparation of a meal.
 - Code 2 - Kitchen Equipment
- (a) All other equipment not listed under Code 1.
 - Code 2 - Plumbing
- (a) Flush valves not operating properly
- (b) Fixture drain, supply line commode, or water pipe leaking.
- (c) Commode leaking at base.
 - Code 3 - Plumbing
- (a) Leaking faucets

- Code 1 - Refrigeration
 - (a) Mess Hall.
 - (b) Medical storage.
- Code 2 - Refrigeration
 - (a) Mess hall - other than walk-in refrigerators and freezers.
- Code 1 - Roof Leaks
 - (a) Temporary repairs will be made where major damage to property is occurring.
- Code 2 - Roof Leaks
 - (a) Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.
- Code 1 - Sprinkler System
 - (a) All sprinkler systems, valves, manholes, deluge systems, and air systems to sprinklers.
- Code 1 - Tank Wash Racks (Bird Baths)
 - (a) All systems which prevent tank wash.
- Code 1 - Water (Exterior)
 - (a) Normal operation of water pump station.
- Code 2 - Water (Exterior)
 - (a) No water to facility.
- Code 1 - Water, Hot (and Steam)
 - (a) Barracks (entire building).
- Code 2 - Water, Hot
 - (a) No hot water in portion of building listed under Code 1

1.4.5.5. Should parts be required to complete the work and the parts are not immediately available, the Contractor shall have a maximum of 12 hours after arrival at the job site to provide the Government, with firm written proposals for emergency alternatives and temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractor's proposals shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair. The Government will evaluate the proposed alternatives and negotiate the alternative considered to be in the best interest of the Government to reduce the impact of the emergency condition. Alternatives considered by the Government will include the alternative for the Contractor to "Do Nothing" while waiting until the required parts are available to perform permanent warranty repair. Negotiating a proposal which will require Government participation and the expenditure of Government funds shall constitute a separate procurement action by the using service.

1.4.6. Equipment Warranty Identification Tags

1.4.6.1. Provide warranty identification tags at the time of installation and prior to substantial completion shall provide warranty identification tags on all Contractor and Government furnished equipment which the Contractor has installed.

- (a) The tags shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Tag each component of contractor furnished equipment that has differing warranties on its components.
- (b) Submit sample tags, representing how the other tags will look, for Government review and approval.
- (c) Tags for Warranted Equipment: The tag for this equipment shall be similar to the following: Exact format and size will be as approved.

MFG WARRANTY(IES) EXPIRE

MFG WARRANTY(IES) EXPIRE

(d) If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag

1.4.6.2. Execution: Complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment.

1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Submit; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems prior to final inspection and transfer of the completed facility for approval, as specified in applicable technical specification sections.

1.6. OPERATION AND MAINTENANCE MANUALS

1.6.1. General Requirements

1.6.1.1. Inasmuch as the operations and maintenance manuals are required to operate and maintain the facility, the operations and maintenance (O&M) manuals will be considered a requirement prior to substantial completion of any facility to be turned over to the Government. Beneficial occupancy of all or portions of a facility prior to substantial completion will not relieve the Contractor of liquidated damages, if substantial completion exceeds the required completion date.

1.6.1.2. Provide one permanent electronic copy on CD-ROM and 2 hard copies of the Equipment Operating, Maintenance, and Repair Manuals. Provide separate manuals for each utility system as defined hereinafter. Submit Operations and Maintenance manuals for approval before field training or 90 days before substantial completion (whichever occurs earlier). If there is no separate CLIN for O&M Manuals, the Government will withhold an amount representing \$20,000, as non-progressed work, until submittal and approval of all O&M manuals are complete.

1.6.2. Definitions

1.6.2.1. Equipment

A single piece of equipment operating alone or in conjunction with other equipment to accomplish a system function.

1.6.2.2. System

A combination of one or more pieces of equipment which function together to accomplish an intended purpose (i.e. HVAC system is composed of many individual pieces of equipment such as fans, motors, compressors, valves, sensors, relays, etc.)

1.6.3. Hard Cover Binders

The manuals shall be hard cover with posts, or 3-ring binders, so sheets may be easily substituted. Print the following identification on the cover: the words "EQUIPMENT OPERATING, MAINTENANCE, AND REPAIR MANUALS," the project name, building number, and an indication of utility or systems covered, the name of the Contractor, and the Contract number. Manuals shall be approximately 8-1/2 by 11-inches with large sheets folded in and capable of being easily pulled out for reference. All manuals for the project must be similar in appearance, and be of professional quality.

1.6.4. Warning Page

Provide a warning page to warn of potential dangers (if they exist, such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, high pressures, etc.). Place the warning page inside the front cover and in front of the title page. Include any necessary Material Safety Data Sheets (MSDS) here.

1.6.5. Title Page

The title page shall include the same information shown on the cover and show the name of the preparing firm and the date of publication.

1.6.6. Table of Contents

Each volume of the set of manuals for this project shall include a table of contents, for the entire set, broken down by volume.

1.6.7. GENERAL

Organize manuals according to the following format, and include information for each item of equipment. Submit a draft outline and table of contents for approval at 50% contract completion.

TABLE OF CONTENTS

PART I: Introduction

- Equipment Description
- Functional Description
- Installation Description

PART II: Operating Principles

PART III: Safety

PART IV: Preventive Maintenance

- Preventive Maintenance Checklist, Lubrication
- Charts and Diagrams

PART V: Spare Parts Lists

- Troubleshooting Guide
- Adjustments
- Common Repairs and Parts Replacement

PART VI: Illustrations

1.6.7.1. Part I-Introduction

Part I shall provide an introduction, equipment or system description, functional description and theory of operation, and installation instructions for each piece of equipment. Include complete instructions for uncrating, assembly, connection to the power source and pre-operating lubrication in the installation instructions as applicable. Illustrations, including wiring and cabling diagrams, are required as appropriate in this section. Include halftone pictures of the equipment in the introduction and equipment description, as well as system layout drawings with each item of equipment located and marked. Do not use copies of previously submitted shop drawings in these manuals.

1.6.7.2. Part II-Operating Principles

Part II shall provide complete instructions for operating the system, and each piece of equipment. Illustrations, halftone pictures, tables, charts, procedures, and diagrams are required when applicable. This will include step-by-step procedures for start-up and shutdown of both the system and each component piece of equipments, as well as adjustments required to obtain optimum equipment performance, and corrective actions for malfunctions. Show performance sheets and graphs showing capacity data, efficiencies, electrical characteristics, pressure drops, and flow rates here, also. Marked-up catalogs or catalog pages do not satisfy this requirement. Present performance information as concisely as possible with only data pertaining to equipment actually installed. Include actual test data collected for Contractor performance here.

1.6.7.3. Part III-Safety

Part III shall contain the general and specific safety requirements peculiar to each item of equipment. Repeat safety information as notes cautions and warnings in other sections where appropriate to operations described.

1.6.7.4. Part IV-Preventive Maintenance

Part IV shall contain a troubleshooting guide, including detailed instructions for all common adjustments and alignment procedures, including a detailed maintenance schedule. Also include a diagnostic chart showing symptoms and solutions to problems. Include test hookups to determine the cause, special tools and test equipment, and methods for returning the equipment to operating conditions. Information may be in chart form or in tabular format with appropriate headings. Include instructions for the removal, disassembly, repair, reassembly, and replacement of parts and assemblies where applicable and the task is not obvious.

1.6.7.5. Part V-Spare Parts List

Part V shall contain a tabulation of description data and parts location illustrations for all mechanical and electrical parts. The heading of the parts list shall clearly identify the supplier, purchase order number, and equipment. Include the unit price for each part. List parts by major assemblies, and arrange the listing in columnar form. Include names and addresses of the nearest manufacturer's representatives, as well as any special warranty information. Provide a list of spare parts that are recommended to be kept in stock by the Government installation.

1.6.7.6. Part VI-Illustrations

Part VI shall contain assembly drawings for the complete equipment or system and for all major components. Include complete wiring diagrams and schematics. Other illustrations, such as exploded views, block diagrams, and cutaway drawings, are required as appropriate.

1.6.8. Framed Instructions

Post framed instructions are required for substantial completion. Post framed instructions under glass or in laminated plastic, including wiring and control diagrams showing the complete layout of the entire system, including equipment, ductwork, piping valves, dampers, and control sequence at a location near the equipment described. Prepare condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation, valve schedule and procedures for safely starting and stopping the system in type form, framed as specified above for the wiring and control diagrams and posted beside the diagrams. Submit proposed diagrams, instructions, and other sheets prior to posting. Post the framed instructions before field training.

1.6.9. (Reserved. See 1.7 for Field Training)

1.6.10. System/Equipment Requirements

1.6.10.1. Facility Heating System

Provide information on the following equipment: boilers, water treatment, chemical feed pumps and tanks, converters, heat exchangers, pumps, unit heaters, fin-tube radiation, air handling units (both heating only and heating and cooling), and valves (associated with heating systems).

1.6.10.2. Air-Conditioning Systems

Provide information in chillers, packaged air-conditioning equipment, towers, water treatment, chemical feed pumps and tanks, air-cooled condensers, pumps, compressors, air handling units, and valves (associated with air-conditioning systems).

1.6.10.3. Temperature Control and HVAC Distribution Systems

Provide all information described for the following equipment: valves, fans, air handling units, pumps, boilers, converters and heat exchangers, chillers, water cooled condensers, cooling towers, and fin-tube radiation, control air compressors, control components (sensors, controllers, adapters and actuators), and flow measuring equipment.

1.6.10.4. Central Heating Plants

Provide the information described for the following equipment: boilers, converters, heat exchangers, pumps, fans, steam traps, pollution control equipment, chemical feed equipment, control systems, fuel handling equipment, de-aerators, tanks (flash, expansion, return waters, etc.), water softeners, and valves.

1.6.10.5. Heating Distribution Systems

Provide the information described for the following equipment: valves, fans, pumps, converters and heat exchangers, steam traps, tanks (expansion, flash, etc.), and piping systems.

1.6.10.6. Exterior Electrical Systems

Provide information on the following equipment: power transformers, relays, reclosers, breakers, and capacitor bank controls.

1.6.10.7. Interior Electrical Systems

Provide information on the following equipment: relays, motor control centers, switchgear, solid state circuit breakers, motor controller, EPS lighting systems, wiring diagrams and troubleshooting flow chart on control systems, and special grounding systems.

1.6.10.8. Energy Monitoring and Control Systems

The maintenance manual shall include descriptions of maintenance for all equipment, including inspection, periodic preventative maintenance, fault diagnosis, and repair or replacement of defective components.

1.6.10.9. Domestic Water Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentation, laboratory test equipment, chemical feeders, valves, switching gear, and automatic controls.

1.6.10.10. Wastewater Treatment Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentations, laboratory test equipment chemical feeders, valves, scrapers, skimmers, comminutors, blowers, switching gear, and automatic controls.

1.6.10.11. Fire Protection Systems

Provide information on the following equipment: alarm valves, manual valves, regulators, foam and gas storage tanks, piping materials, sprinkler heads, nozzles, pumps, and pump drivers.

1.6.10.12. Fire Alarm and Detection Systems

- (1) The maintenance manual shall include description of maintenance for all equipment, including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.
- (2) Provide all software; database with complete identification of programmable portions of system equipment and devices, and all other system programming data on all modes of the system; connecting cables; and proprietary equipment necessary for the operation, maintenance, testing, repair and programming, etc. of the system and that may be required for implementation of future changes to the fire system (additional and/or relocated initiating devices, notification devices, etc.
- (3) Provide all system and equipment technical data and computer software with the requisite rights to Government use, in accordance with the applicable contract clauses.
- (4) Training shall include software and programming required for the effective operation, maintenance, testing, diagnostics and expansion of the system.

1.6.10.13. Plumbing Systems

Provide information on the following equipment: water heaters, valves, pressure regulators backflow preventors, piping materials, and plumbing fixtures.

1.6.10.14. Liquid Fuels Systems

Provide information on the following equipment: tanks, automatic valves manual valves, filter separators, pumps, mechanical loading arms, nozzles, meters, electronic controls, electrical switch gear, and fluidic controls.

1.6.10.15. Cathodic Protection Systems

Provide information on the following material and equipment: rectifiers, meters, anodes, anode backfill, anode lead wire, insulation material and wire size, automatic controls (if any), rheostats, switches, fuses and circuit breakers, type and size of rectifying elements, type of oil in oil-immersed rectifiers, and rating of shunts.

1.6.10.16. Generator Installations

Provide information on the following equipment: generator sets, automatic transfer panels, governors, exciters, regulators starting systems, switchgear, and protective devices.

1.6.10.17. Miscellaneous Systems

Provide information on the following: communication and ADP systems, security and intrusion alarm, elevators, material handling, active solar, photovoltaic, nurse call, paging, intercom, closed circuit TV, irrigation, sound and material delivery systems, kitchen, refrigeration, disposal, ice making equipment, and other similar type special systems not otherwise specified.

1.6.10.18. Laboratory, Environmental and Pollution Control Systems

Provide information on the following equipment: wet scrubbers, quench chambers, scrub tanks, liquid oil separators, and fume hoods.

1.7. FIELD TRAINING

Field Training is a requirement for substantial completion. Conduct a training course for the operating staff for each particular system. Conduct the training is to be conducted during hours of normal working time after the system is functionally complete. The field instructions shall cover all of the items contained in the Equipment Operating, Maintenance and Repair Manuals. The training will include both classroom and "hands-on" training. Submit a lesson plan outlining the information to be discussed during training periods. Submit this lesson plan for approval 90 days before contract completion before the field training occurs. Record training on DVD and furnish to the Government within ten (10) days following training. Document all training and furnish a list of all attendees.

1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY

Promptly furnish and require any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, except prices do not need to be provided for Government-Furnished Property.

1.9. LEED REVIEW MEETINGS

1.9.1. Pre-Closeout Meeting. Approximately 30 days before submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the documentation, determine which, if any, credits will be audited and identify any corrections/missing items prior to the closeout LEED documentation submittal.

1.9.2. Approximately 14 days after submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the LEED closeout

documentation. The review conference will include discussion of and resolution of all review comments to ensure consensus on achievement of credits and satisfactory documentation. At the review conference a final score will be determined and endorsed in writing by all parties.

1.10. RED ZONE MEETING

At approximately 80% of contract completion or 60 days before the anticipated Beneficial Occupancy Date (BOD), whichever occurs first, the Contractor and the Government's project delivery team will conduct what is known as the Red Zone Meeting to discuss the close-out process, to schedule the events and review responsibilities for actions necessary to produce a timely physical, as well as fiscal, project close-out. The Red Zone meeting derives its name from the football term used to describe the team effort to move the ball the last 20 yards into the end zone. The close-out of a construction project sometimes can be equally as hard and most definitely requires the whole team's efforts. The ACO will chair the meeting. If not already provided, shortly before the meeting, the Contractor shall provide an electronic copy or access to the CADD as-built drawings, completed commensurate with the amount of work completed at the time of the Red Zone Meeting, as an indicator of the Contractors' understanding of and ability to meet the USACE CADD Standards and to ensure that the Contractor is making progress with CADD As-Built requirements. EXHIBIT 1 is a generic meeting checklist.

1.11. FINAL CLEANING

Clean the premises in accordance with FAR clause 52.236-12 and additional requirements stated here. Remove stains, foreign substances, and temporary labels from surfaces. Vacuum carpet and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean or replace filters of operating equipment if cleaning isn't possible or practicable. Remove debris from roofs, drainage systems, gutters, and downspouts. Sweep paved areas and rake clean landscaped areas. Remove waste, surplus materials, and rubbish from the site. Remove all temporary structures, barricades, project signs, fences and construction facilities. Submit a list of completed clean-up items on the day of final inspection.

1.12. INTERIM FORM DD1354 "TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft provided with the final design package(s) (see Section 01 33 16, paragraph 3.7.5) and submit an accounting of all installed property on Interim Form DD1354 "Transfer and Acceptance of Military Real Property." Include any additional assets/improvements/alterations and cost updates from the Draft DD Form 1354. Contact the COR for any project specific information necessary to complete the DD Form 1354. This form will be a topic for the Red Zone Meeting discussed above. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site: <http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf> Submit the completed Checklist for Form DD1354 of Government-Furnished and Contractor-Furnished/Contractor Installed items. Attach this list to the updated DD Form 1354. Instructions for completing the form and a blank checklist (fill-able) in ADOBE (PDF) may be obtained at the following web site: http://www.wbdg.org/ccb/DOD/UFC/ufc_1_300_08.pdf

EXHIBIT 1

SAMPLE

Red Zone Meeting Checklist

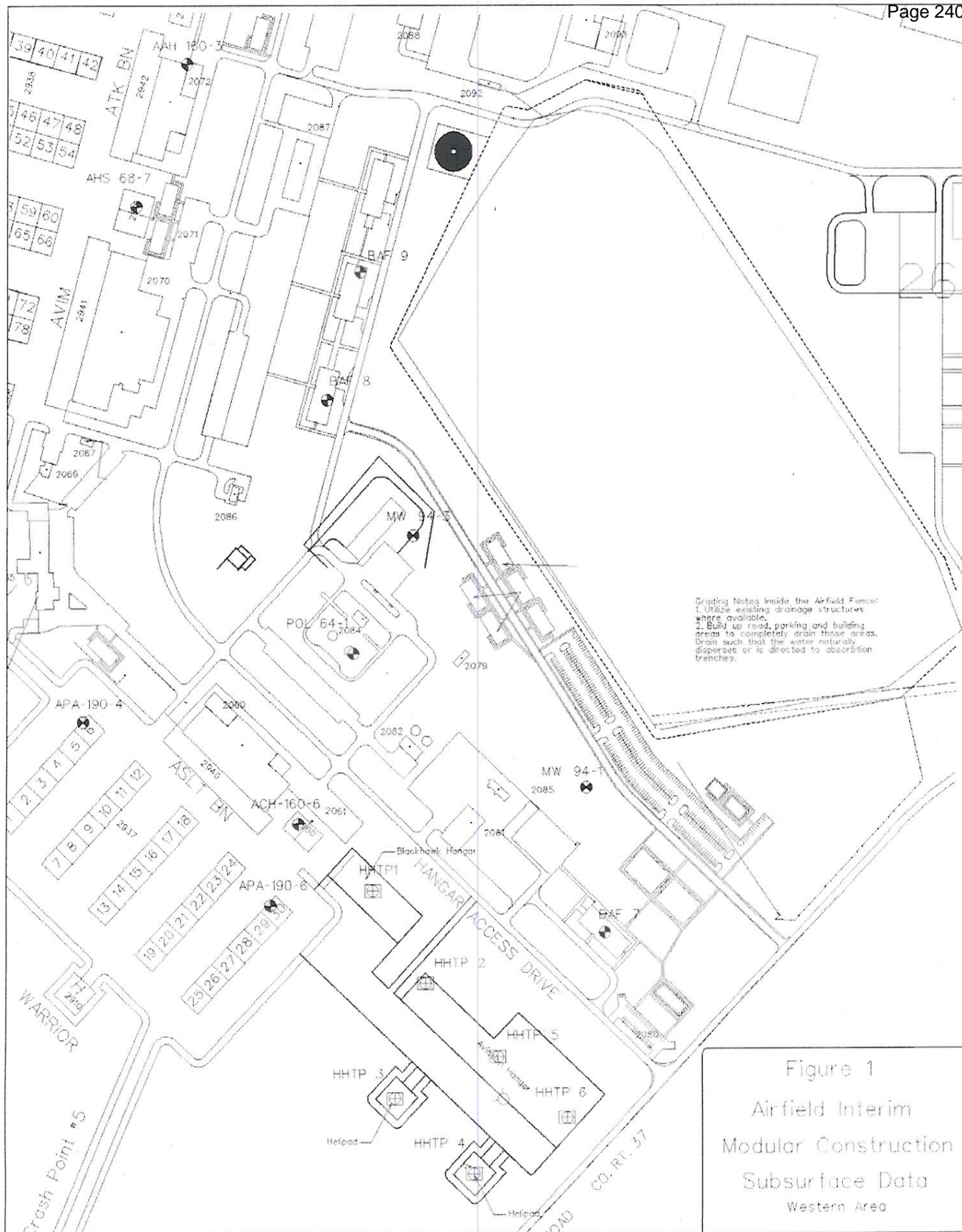
Date: _____

Contract No.	
Description / Location	
Contractor	
Contracting Officer	

Action	Completion Milestone	√
Inspections		
Fire		
Safety		
Pre-final		
Mechanical Test & Balance		
Commissioning		
Landscaping Complete		
Erosion Control		
Beneficial Occupancy Date (BOD)		
Furniture Installation		
Comm Installation		
As-Built Drawings		
Provide all O&M manuals, tools, shop drawings, spare parts, etc. to customer		
Training of O&M Personnel		
Provide Warranty documents to Customer		
Contract completion		

Ribbon cutting		
Payroll Clearances		
DD Form 2626 - Construction Contractor Performance Evaluation		
DD Form 2631 – A-E Performance Rated after Construction		
Status of Pending Mods and REA's/Claims		
Final Payment Completed		
Release of Claims		
Return of Unobligated Funds		
Move Project from CIP to General Ledger		
Financial completion		

End of Section 01 78 02.00 10



HHTTP 1				450868	
AF Modular Construction				320251	
DEPTH	DEPTH	SAMPLE NUMBER	LEGEND	CLASSIFICATION OF MATERIALS <i>Describe</i>	REMARKS
	1			Dark brown, Sandy organic Soil (OL-OH)	Topsoil = .5'
	2	①		Yellow-brown, fine-medium SAND trace Silt (SP)	Clean Fill
	3			Dark brown, Sandy organic Soil (OL-OH)	Buried Topsoil frozen to 1.5'
	4			Yellow-brown, fine-medium SAND trace Silt (SP)	
	5	②		Light brown to tan, medium to coarse SAND, trace Silt and fine rounded Gravel (SP)	Sides collapsing during excavation
	6				moist
	7				T.D. = 10.1'
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				

○ Sample selected for testing

HHTTP 2				450776	
AF Modular Construction				320306	
DEPTH	DEPTH	SAMPLE NUMBER	LEGEND	CLASSIFICATION OF MATERIALS <i>Describe</i>	REMARKS
	1			Dark brown, Sandy organic Soil (OL-OH)	Topsoil = .5'
	2	①		Yellow-brown, fine-medium SAND trace Silt and Gravel (SP)	frozen to 1.6'
	3			Light brown to tan, medium to coarse SAND, trace Silt and fine rounded Gravel (SP)	Gravel = round
	4				2.6'
	5	②			horizontal laminations
	6				Sides collapsing during excavation
	7				
	8				moist
	9				
	10				T.D. = 10.2'
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				

HHTTP 5				450701	
AF Modular Construction				320381	
DEPTH	DEPTH	SAMPLE NUMBER	LOGS	CLASSIFICATION OF MATERIALS (Description)	Remarks
	1			Dark brown, Sandy organic Soil (OL-OH)	Topsoil = 1.2'
	2	①		Yellow-brown, fine-medium SAND	Frozen to 1.8'
	3			trace Silt and round Gravel (SP)	moist
	4				3.2'
	5	②		Light brown to tan, fine to medium SAND, trace Silt and round Gravel (SP)	Sides collapsing during excavation
	6				horizontal laminations
	7				moist
	8				
	9				
	10				
	11				T.D. = 10.5'
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				

○ Sample selected for testing

HHTTP 6				450640	
				320452	
DEPTH	DEPTH	SAMPLE NUMBER	LOGS	CLASSIFICATION OF MATERIALS (Description)	Remarks
	1			Dark brown, Sandy organic Soil (OL-OH)	Topsoil = .9'
	2			Yellow-brown, fine-medium SAND	moist
	3			trace Silt and round Gravel (SP)	2.8'
	4				
	5			Light brown to tan, medium to coarse SAND, trace Silt and fine, rounded Gravel (SP)	
	6				
	7				
	8				Excavated to 8' feet before walls
	9				moist
	10				T.D. = 10.0'
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				

Drawing List

- C-1 Site Location Plan
- C-2 Enlarged Site Plan
- C-3 Enlarged Site Utility Plan
- A-1 Overall First Floor Plan
- A-2 Enlarged First Floor Plan – Maintenance Area
- A-3 Enlarged First Floor Plan – Medivac Readiness
- A-4 Overall Second Floor Plan
- A-5 Enlarged Second Floor Plan – Maintenance Area
- A-6 Exterior Elevation / Interior Elevation

Please refer to Civil drawings in Appendix J for Utility Connection information.

APPENDIX D
Results of Fire Flow Tests

Not Used

APPENDIX E
Environmental Information

Not Used

APPENDIX F

Conceptual Aesthetic Considerations

Not Used

APPENDIX G
GIS Data

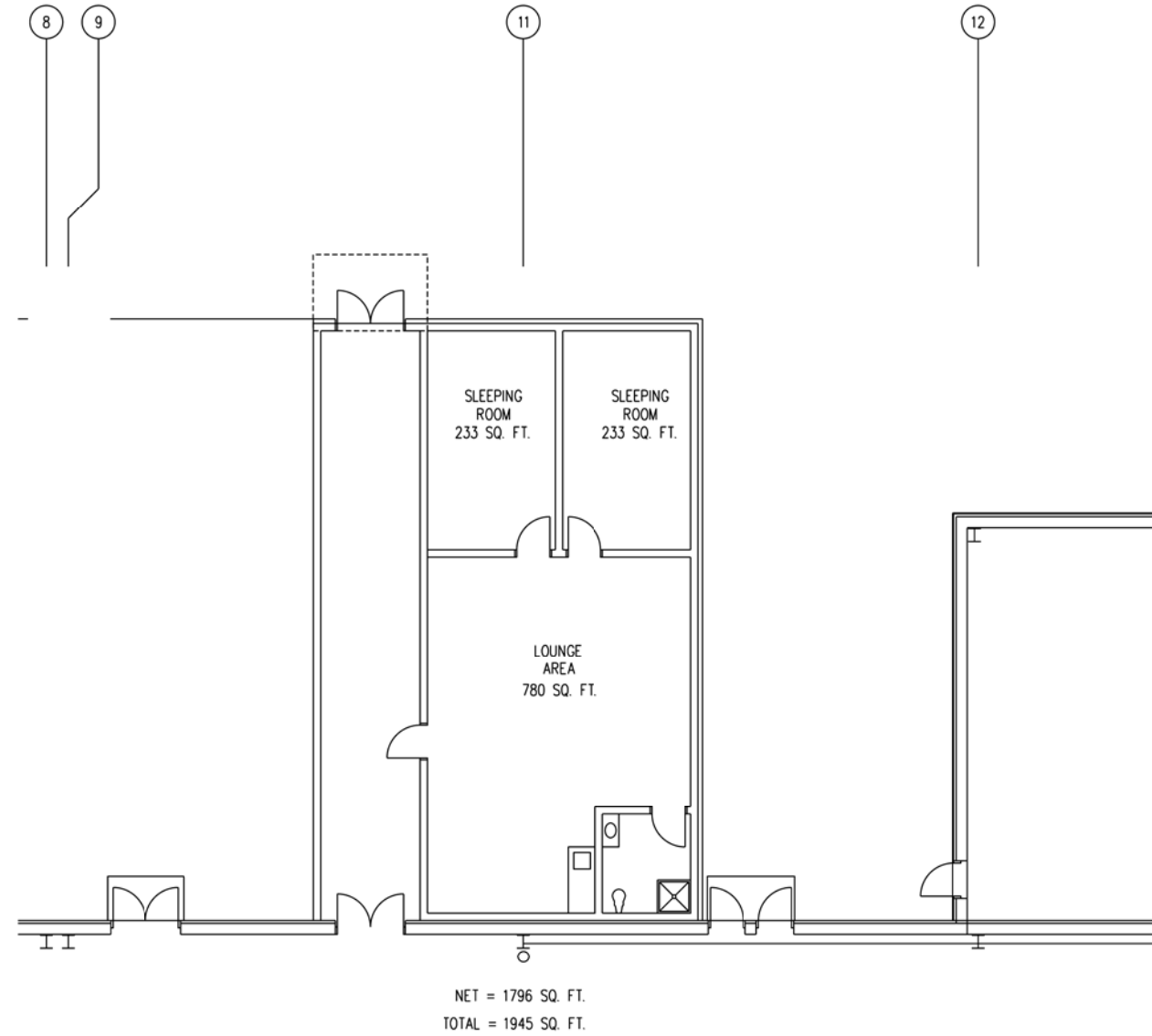
Not Used

APPENDIX H Exterior Signage

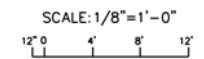
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


APPENDIX I
Acceptable Plants List

Not Used



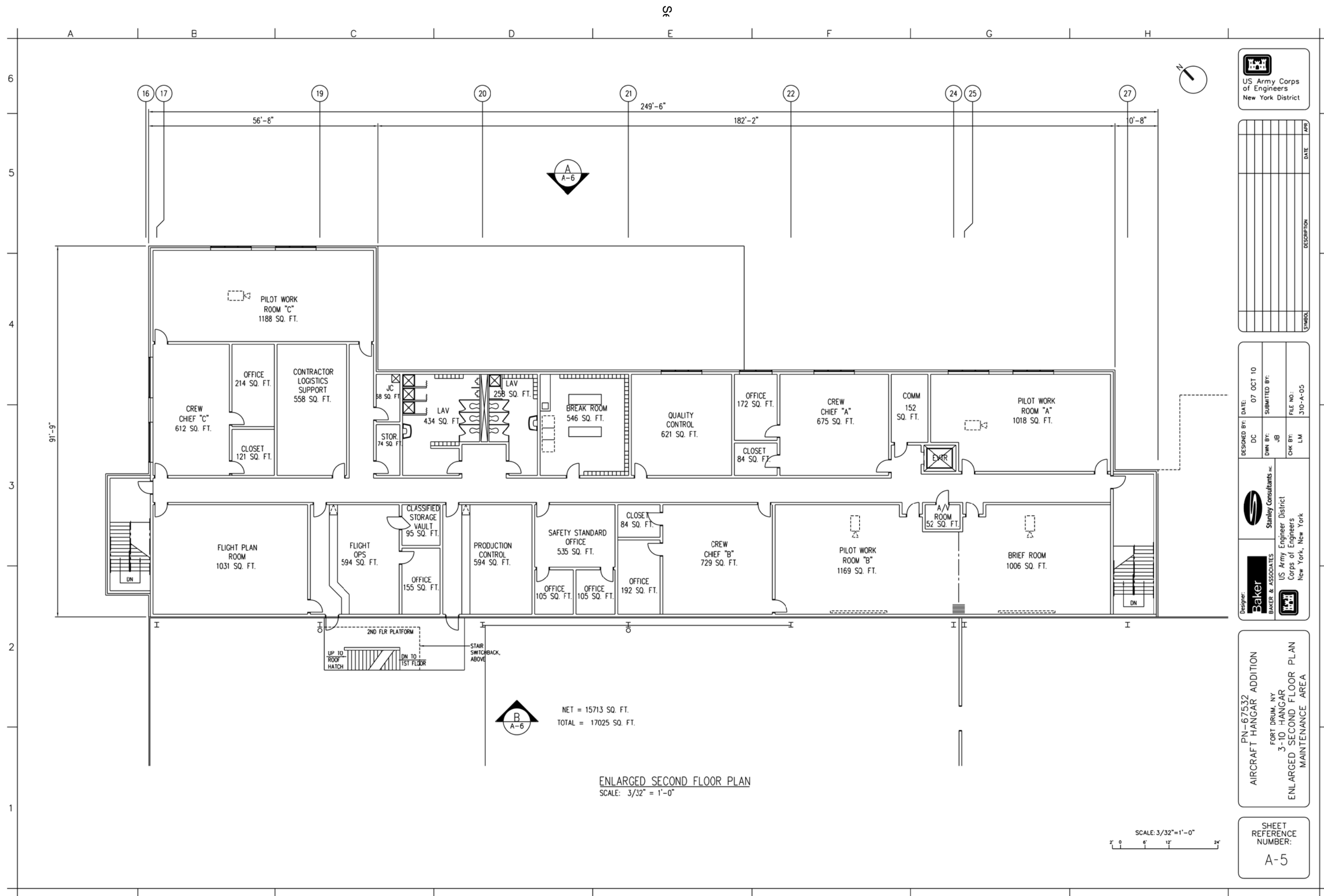
ENLARGED FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

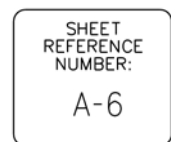
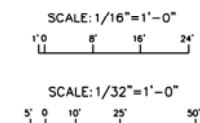
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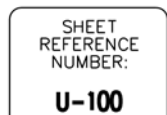
 Baker BAKER & ASSOCIATES	 Stanley Consultants inc.	DESIGNED BY:	DC	DATE:	07 OCT 10
		DWN BY:	JB	SUBMITTED BY:	
 US Army Engineer District Corps of Engineers New York, New York		CHK BY:	LM	FILE NO.:	310-A-03

PN-67532
AIRCRAFT HANGAR ADDITION
FORT DRUM, NY
3-10 HANGAR
ENLARGED FIRST FLOOR PLAN
MEDIVAC READINESS

SHEET
REFERENCE
NUMBER:
A-3







Cable Splice Points

Copper Cable – Splice in MH X4A to Cable:
CA 710, 801 – 1400 (600 Pair)

Fiber Optic Cable – Splice in MH X4 to
Cable:
FOC 17, 181 – 228 (48 SM)

Note: The Fiber Optic Splice Location will
not change, but the Strand Counts to be
spliced need to be confirmed. (Tags were
not placed from earlier projects)

HANGAR ACCESS DRIVE

Existing MH- X4A
MH is Racked and
Bonded

Existing MH - X4
MH is NOT Racked
and Bonded

Install 2 - 4" Conduits
w/ 1 - 3" Mesh Cell
Inner Duct to Existing
Handhole

Install 1 External – Pull Box
Appropriately Sized to
support 2 - 4" PVC Conduits

Install 2 - 4" IMT or RSC in
accordance with the 2010 I3A
& TIA 569-B. To New TR
Room

Install 2 - 4" Conduits
w/ 3 - 3" Mesh Cell
Inner Duct to MH - X4
Approx. 90' +/-

Install 6 - 4" Conduits
2 - 4" Conduits w/ 3 - 3"
Mesh Cell Inner Duct

New Splayed MH to be
installed
I3A Racked and Bonded

Install 4 - 4" Conduits
1 - 4" Conduit w/ 3 - 3"
Mesh Cell Inner Duct

TR Room
14' L x 9' W
126 Sqft.

Wednesday, November 10, 2010

APPENDIX K Fuel Cost Information

The following utility rates for this installation are provided for design

Electrical:

Demand Charge - \$0.1145 per kilowatt

Natural Gas:

Commodity Charge Rate - \$ 0.9362 per therm

Water:

Commodity Charge Rate - \$4.2268 per [thousand gallons]

Sewer:

Commodity Charge Rate - \$3.8145 per [thousand gallons]

LEED Project Credit Guidance (OCT 09)

This spreadsheet indicates Army required credits, Army preferred credits, project-specific ranking of individual point preferences, assumptions guidance for individual credits, and references to related language in the RFP for individual credits.

LEED 2.2 Credit Paragraph	LEED Project Credit Guidance	Army Guidance: Required - Preferred - Avoid Project Preference Ranking: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)		
PAR	FEATURE			REMARKS
SUSTAINABLE SITES				
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
SS1	Site Selection		1	See paragraph LEED CREDITS COORDINATION.
SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	See paragraph LEED CREDITS COORDINATION.

	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		X	See paragraph LEED CREDITS COORDINATION.
SS3	Brownfield Redevelopment		X	See paragraph LEED CREDITS COORDINATION.
SS4.1	Alternative Transportation: Public Transportation Access		X	See paragraph LEED CREDITS COORDINATION.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref	1	Assume that non-transient building occupants are NOT housed on Post unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1			Requires provision of vehicles, which cannot be purchased with construction funds. Assume Government will not provide vehicles unless indicated otherwise. Assume that 50% of GOV fleet is NOT alternative fuel vehicles unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	Pref	1	
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3			Requires provision of vehicle refueling stations. Installation must support type of fuel and commit to maintaining/supporting refueling stations.
SS4.4	Alternative Transportation: Parking Capacity	Pref	1	
SS5.1	Site Development: Protect or Restore Habitat			

SS5.2	Site Development: Maximize Open Space	Pref	1	Assume AGMBC option for aggregated open space at another location on the installation is not available to the project unless indicated otherwise.
SS6.1	Stormwater Design: Quantity Control	Pref	1	See paragraph STORMWATER MANAGEMENT.
SS6.2	Stormwater Design: Quality Control	Pref	1	See paragraph STORMWATER MANAGEMENT.
SS7.1	Heat Island Effect: Non-Roof			
SS7.2	Heat Island Effect: Roof	Pref	1	Coordinate with nearby airfield requirements, which may preclude this credit.
SS8	Light Pollution Reduction	Pref	1	
<u>WATER EFFICIENCY</u>				
WEPR1	Water Use Reduction (Version 3 only)	Rqd	Rqd	All LEED prerequisites are required to be met.
WE1.1	Water Efficient Landscaping: Reduce by 50%	Pref	1	See paragraph IRRIGATION. Project must include landscaping to be eligible for this credit.
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	Pref	1	Project must include landscaping to be eligible for this credit.
WE2	Innovative Wastewater Technologies - OPTION 1			
WE2	Innovative Wastewater Technologies - OPTION 2			
WE3	Water Use Reduction	Pref	1	See paragraph BUILDING WATER USE REDUCTION.
<u>ENERGY AND ATMOSPHERE</u>				

EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR2	Minimum Energy Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EA1	Optimize Energy Performance	Rqd	1	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION , as a minimum, is required.
EA2.1	On-Site Renewable Energy	Pref		See paragraph ENERGY CONSERVATION .
EA3	Enhanced Commissioning			The Commissioning Authority may be provided through the Design-Build Contractor only if in accordance with USGBC Credit Interpretation Ruling (CIR) dated 9/15/06. Commissioning Authority activities begin during design phase and continue well beyond beneficial occupancy. Assume Government will not provide CxA post-occupancy activities unless indicated otherwise.
EA4	Enhanced Refrigerant Management			
EA5	Measurement & Verification			Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		X	See paragraph LEED CREDITS COORDINATION .
MATERIALS AND RESOURCES				
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Coordinate with

				Installation during design development on collection service and receptacles.
MR1	Building Reuse			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref	1	See paragraph CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref	1	
MR3	Materials Reuse			
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Pref	1	See paragraph RECYCLED CONTENT.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Pref	1	
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally		1	
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally		1	
MR6	Rapidly Renewable Materials	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS and paragraph FEDERAL BIOBASED PRODUCTS PREFERRED

				PROCUREMENT PROGRAM.
MR7	Certified Wood	Pref	1	See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS.
INDOOR ENVIRONMENTAL QUALITY				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Assume all buildings are smoke free unless indicated otherwise (family housing, barracks and other lodging are facility types where smoking may be permitted in some cases).
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			
EQ3.1	Construction IAQ Management Plan: During Construction	Pref	1	See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref	1	See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	Pref	1	See paragraph LOW-EMITTING MATERIALS.
EQ4.2	Low Emitting Materials: Paints & Coatings	Pref	1	See paragraph LOW-EMITTING MATERIALS.
EQ4.3	Low Emitting Materials: Carpet/Flooring Systems	Pref	1	See paragraph LOW-EMITTING MATERIALS.
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref	1	See paragraph LOW-EMITTING MATERIALS.
EQ5	Indoor Chemical & Pollutant Source Control	Pref	1	System requiring weekly cleaning to earn this credit is not a permitted option unless indicated

				otherwise.
EQ6.1	Controllability of Systems: Lighting		1	
EQ6.2	Controllability of Systems: Thermal Comfort			
EQ7.1	Thermal Comfort: Design	Pref	1	See paragraph APPLICABLE CRITERIA
EQ7.2	Thermal Comfort: Verification			Project must earn credit EQ7.1 to be eligible for this credit. Assume Government will not provide post-occupancy activities unless indicated otherwise.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	Pref		See paragraph DAYLIGHTING.
EQ8.2	Daylight & Views: Views for 90% of Spaces	Pref		
INNOVATION & DESIGN PROCESS				
IDc1.1	Innovation in Design			See paragraph INNOVATION AND DESIGN CREDITS. Assume Government will not provide any activities associated with ID credits.
IDc1.2	Innovation in Design			
IDc1.3	Innovation in Design			
IDc1.4	Innovation in Design			
IDc2	LEED Accredited Professional	Rqd	Rqd	LEED AP during design and construction is required.
REGIONAL PRIORITY CREDITS (Version 3 only)				See paragraph LEED CREDITS COORDINATION.

APPENDIX M
LEED Owner's Project Requirements

Not Used

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

APPENDIX O
LEED Strategy Tables

Not Used

APPENDIX P

LEED Registration of Army Projects

15 April 2010

Number of Registrations

Each building must be registered separately, except multiple instances of a standard building on a shared site may be registered as a single project. If a single registration for multiple buildings is chosen, all buildings under the single registration must earn exactly the same points. Do not register buildings that are exempt from a specific LEED achievement requirement.

Typical Registration Procedure

1. Login, complete the online registration form (see guidance below) at the GBCI LEED Online website <http://www.gbci.org/DisplayPage.aspx?CMSPageID=174> and submit it online.
2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
3. GBCI will follow up with a final invoice, the LEED-online passwords and template information.
4. The individual who registers the project online is, by default, the Project Administrator.

Completing the Registration Form

BEFORE YOU BEGIN:

Create a personal account with USGBC if you do not have one.

You will need the following information:

Project name as it appears in P2 (obtain from USACE Project Manager)

Building number/physical address of project

Zip code for Installation/project location

Anticipated construction start and end dates

Total gross area all non-exempt buildings in registration

Total construction cost all non-exempt buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. Go to <http://www.gbci.org/>, click on "register a project" at the drop-down menu for project certification (at the top of the page) and select "register now for LEED 2009" to start the project registration process. If you have an account, login with your email address and password and select "register new project" to proceed. If you do not have an account, you may select "register a new account" and follow the instructions. It is recommended that you create an account separately on the USGBC website before you start the form. IMPORTANT: USACE team members are members of USGBC and are eligible for Member prices. USACE team members registering projects should be sure to include the USACE Corporate Access ID in their personal account profile (if you do not have it contact richard.l.schneider@usace.army.mil or judith.f.milton@usace.army.mil for the number).
2. The Account/Login Information section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

ELIGIBILITY SECTION

Follow directions (accepting the terms and conditions)

Review your profile information and make corrections if needed

RATING SYSTEM SELECTION SECTION

Select single project registration and I know which rating system.

Select the rating system - currently only LEED-NC and LEED for Homes are approved for Army use without special approval.

LEED Minimum Program Requirements: select YES

RATING SYSTEM RESULTS SECTION

Confirm selected rating system.

PROJECT INFORMATION SECTION

Project Title: Begin the project title with a one-word identifier for the Installation. Do not include the word "Fort". After this match the project name used in P2 (contact the USACE Project Manager for this information) and identify the building being registered. Example: "Stewart 4th IBC - DFAC".

Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever is known to best describe the location of the project on the Installation.

Project City: Installation Name

State, Country, Zip Code: Self-explanatory

Anticipated Construction Start and End Dates: Self-explanatory – give your best guess if unknown. Note that required data entry format is: 1 or 2 digit month/1 or 2 digit date/4 digit year (example 3/23/2010)

Gross Square Footage: Provide total area all buildings in LEED project. Exclude the area of any buildings that are exempt from the LEED achievement requirement (for example, exclude an unconditioned storage shed to be constructed with a barracks complex).

Is Project Confidential: Indicate NO except, if project has security sensitivity (elements that are FOUO or higher security), indicate YES.

Notification of Local Chapter: Indicate NO unless Government/USACE Project Manager requests you to indicate YES.

Anticipated Project Type: Select the most appropriate option from the drop-down menu.

Anticipated Certification Level: Select the applicable option from the drop-down menu (Silver is the usual level).

PROJECT OWNER INFORMATION SECTION

Project Owner First Name, Last Name, email, phone, address: The Project Owner is the USACE Project Manager. Obtain this info from the USACE Project Manager.

Organization: U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field by higher HQ to find all USACE registered projects. You may supplement it with district name at the end but DO NOT revise or use an acronym.

May we publish Owner information: Indicate NO

Owner Type: Pick Federal Government from drop-down menu.

Project Owner Assertion: Check the box

PAYMENT INFORMATION

Self-explanatory

APPENDIX Q
REV 2.1 – 30 SEP 2010
AREA COMPUTATIONS

Computation of Areas: Compute the “gross area” and “net area” of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The “gross area” is the sum of all floor spaces with an average clear height $\geq 6'-11"$ (as measured to the underside of the structural system) and having perimeter walls which are $\geq 4'-11"$. The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating “gross area”:

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- **Covered but not enclosed spaces, canopies, training, and assembly areas**
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the “gross area” calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, “net area” is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall “assignable net area” is determined by subtracting the following spaces from the “gross area”:

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

APPENDIX R

Preliminary Submittal Register

NOTE TO SPECIFIER:

1. Appendix R" will be a Adobe Acrobat pdf version of the Specifier completed "Sample Preliminary Submittal Register." The Sample Register is Excel Spreadsheet format of the RMS Input Form 4288A, which serves two purposes.
2. First, The Register allows the both Government and the Proposers to see and estimate the cost of the Division 00 and Division 01 submittals required by the contract in addition to the Contractor generated submittal register items developed during Design After Award.
3. Secondly, after award, the Government will provide the Contractor the actual Excel Spreadsheet for the Contractor to input the data into RMS to create the Submittal Register used during contract performance. See Section 01 33 00 (Submittal Procedures), paragraph 1.8 (Submittal Register) for the contract requirements.
4. For the contract or task order Solicitation, the Specifier must complete APPENDIX R, found at the following link:
<http://rfpwizard.cecer.army.mil/HTML/Docs/Refs/Sample%20Preliminary%20Submittal%20Register.xls> , save it as a PDF file and then upload it into the Wizard as Appendix R.
5. The RMS Input Form initially includes submittals required by the standardized Model RFP Division 00 and Division 01 Sections, except Section 01 10 00, paragraph 3. Examine the Special Contract Requirements, paragraphs 3 and 6 and any other locally developed portions of the RFP for required submittals and add them to the Input Form. Do not duplicate submittals already listed in the standardized RMS Input Form, because the Contractor needs to submit this information only once.
6. After award, the Government provides the Excel spreadsheet to the selected contractor to develop and input the RMS Input form for the submittal register required by paragraph 1.8 of Section 01 33 00, Submittals.



INSTALLATION DESIGN GUIDE

FORT DRUM, NEW YORK

MOUNTAIN



95% SUBMISSION
NOVEMBER 2009



BUILDING DESIGN STANDARDS

Introduction

The design character of an installation's buildings affect the installation's overall image. The visual analysis of buildings and related structures helps define visual zones and themes and is an important part of an installation's assets and liabilities assessment.

The building design component encompasses the character of the buildings as well as the arrangement of buildings to one another and to their environment. In general, use architectural style, materials, and colors indigenous to the region. The preservation of historically and culturally significant structures adds to an installation's character and provides a sense of heritage.

The visual analysis of structure also includes concern for accessibility, use of materials, placement of entrances, incorporation of additions and renovations, the incorporation of plazas and courtyards, interior design, and the appropriateness and quality of building maintenance.

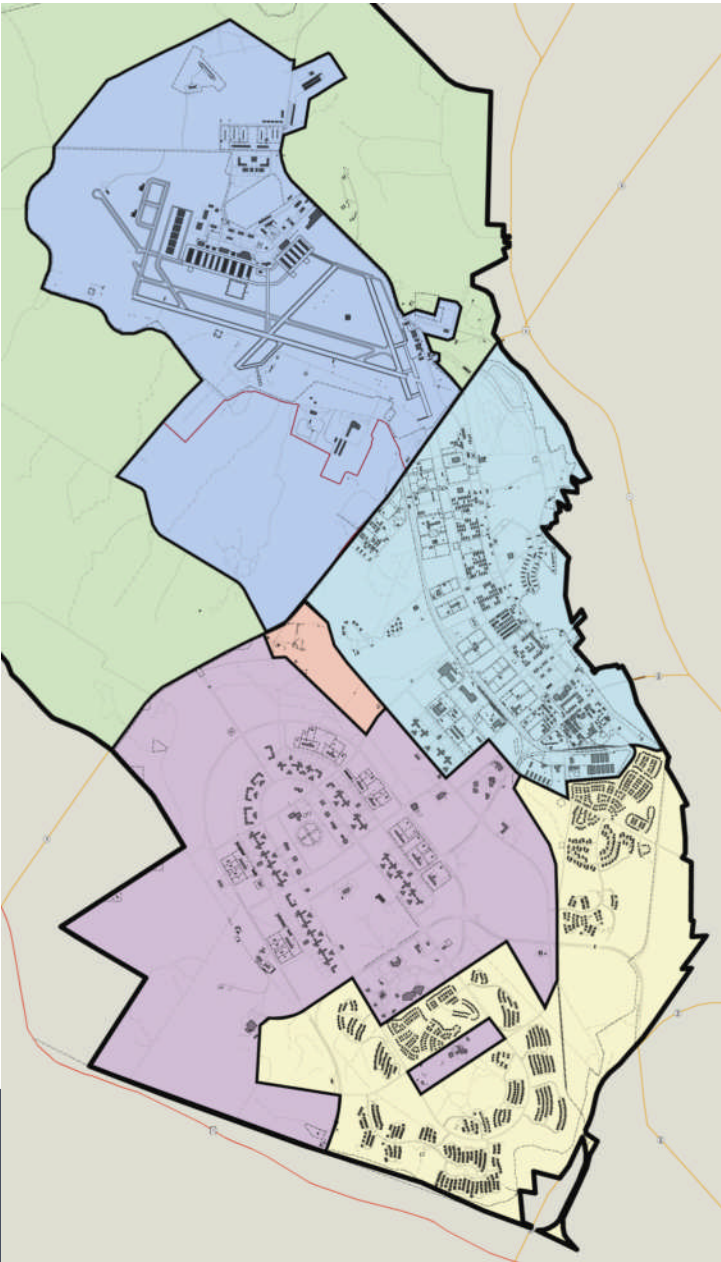
This section provides the objectives and visual determinants that should be utilized to identify and assess the building design quality of the installation. The section also provides standards and guidance pertaining to the development and maintenance of the various interiors and exteriors of buildings on the installation.

Building Design Objectives

Sustainability. The architectural style of existing and future buildings should reflect and reinforce the sustainability of the installation. Sustainable design reduces construction and maintenance costs and conserves energy through proper construction and materials selection. See Appendix D for a more complete discussion on Sustainable Design.

- Adapt building designs to natural site conditions (Fig X-X).
- Develop a coherent architectural style that results in the blending of new and old structures. However, when considering historical buildings one should be able to differentiate between the historic fabric and the new material.
- Combine multiple activities in one building to reduce the number of buildings required and more efficiently utilize limited installation land areas.
- Design facilities adaptive reuse capabilities that can efficiently change interiors to accommodate changing requirements.
- Use indigenous construction materials and practices that require less energy to produce and transport and may be recycled at the end of their use.

FIGURE 7-1 Building Prototypes per Visual Theme Area



Building Prototype	North Post	South Post	Family Housing	Parks & Recreation	Airfield	Ranges & Training
	Administrative					
	Community					
	Industrial & Maintenance					
	Residential					
	Troop Housing					
Unit Operations						

Facility Prototype Standards

Building style contributes significantly to the overall character and distinction of the theme areas established in Section 5 of the IDG. When designing new facilities, the goal of the building designer is to blend the new building with the surrounding structures. This will achieve a cohesive appearance with respect to the context of each Theme and ensure visual compatibility between new and old buildings. The adjacent regulating map identifies the various areas where buildings can assume distinct visual characteristics.

There are a total of six different building prototypes that facilitate the various missions at Fort Drum. Each prototype has its own distinctive architectural quality and palette of colors and materials.

New buildings shall adhere to these guidelines, in addition to adhering to the existing use of architectural proportions, construction techniques, and material assemblies that are indicative of quality construction on Post. The use of materials and color shall match those of existing buildings to further a unified visual appearance.

North Post Area

The North Post Area covers a significant portion of the cantonment area. A majority of the facilities at this location provide housing, mission operations, and community support to Soldiers. The overall facility character in the North Post Area consists of rectilinear structures with hip and gable roofs, which sometimes accentuate entrances. The facades consist of durable materials, such as red brick, and have accents along the base or around windows. The recreational and industrial facilities differ from the rest with wood or metal paneling as the primary facade materials. The industrial facilities are the most basic with few windows and little to no accents in the facade. Facilities range in height from one to three stories.

This area includes the following facility prototypes:

- Administrative
- Community
- Industrial & Maintenance
- Troop Housing
- Unit Operations

FIGURE 7-2 Key Map - North Post Facility Standards Area

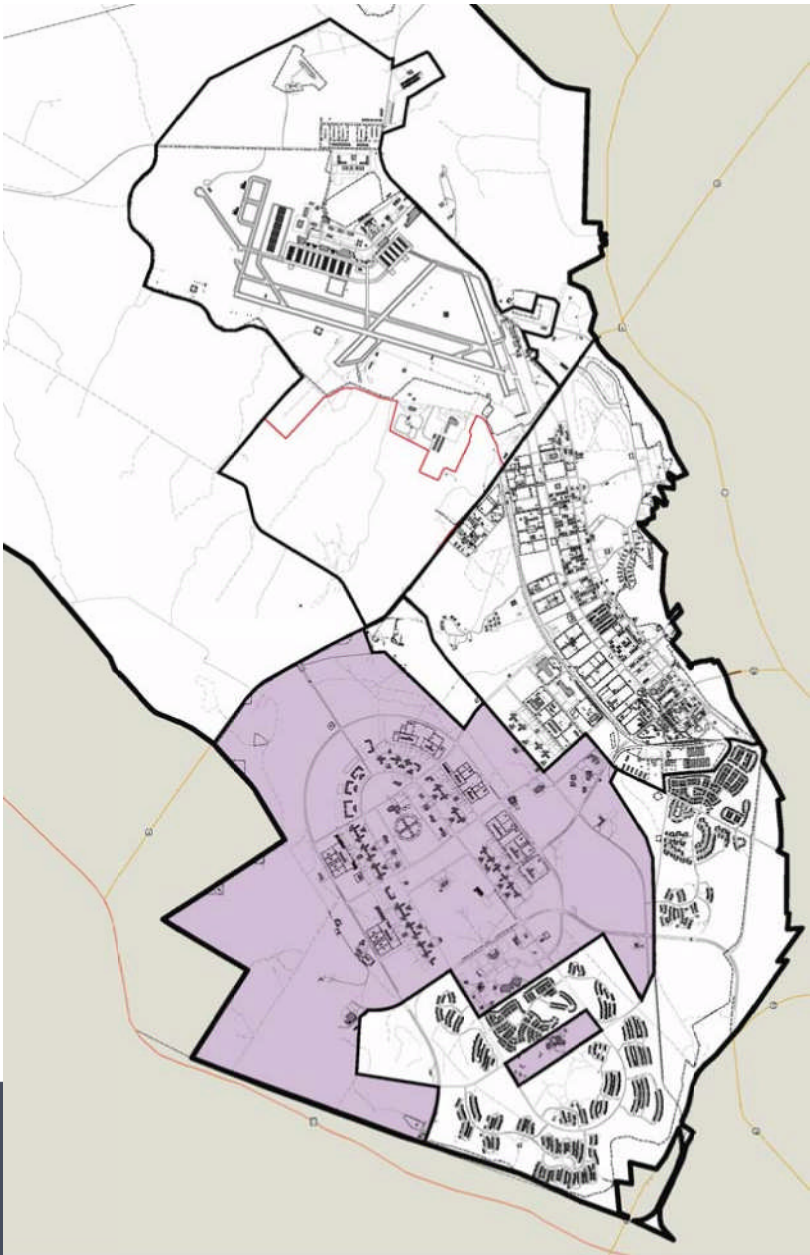


FIGURE 7-3 North Post– Administrative



Item	Material	Color
Roof	Standing Seam Metal	Gray
Walls	Standard Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Material Varies (Optional)	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Gray Hearth
Doors	Material Varies	Gray Hearth

FIGURE 7-4 North Post– Community



Item	Material	Color
Roof	Standing Seam Metal	Gray
Walls	Standard Brick	Old Bridge
Base	Standard Brick / Split-face CMU	10th Mountain Tan
Wall Accents	Split-face CMU, Precast Concrete	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Gray Hearth
Doors	Material Varies	Gray Hearth

FIGURE 7-5North Post– Industrial



Item	Material	Color
Roof	Standing Seam Metal or Flat	Gray
Walls	Metal	Allspice
Base	Split-face CMU	10th Mountain Tan
Wall Accents	N/A	N/A
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Sequoia
Doors	Material Varies	Sequoia

FIGURE 7-6North Post– Troop Housing



Item	Material	Color
Roof	Standing Seam Metal	Gray
Walls	Standard Brick	Old Bridge
Base	Split-Face CMU	10th Mountain Tan
Wall Accents	Split-face CMU, Precast Concrete	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Gray Hearth
Doors	Material Varies	Gray Hearth

FIGURE 7-7 North Post– Unit Operations



Item	Material	Color
Roof	Standing Seam Metal	Gray
Walls	Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Split Face CMU, Precast Conc.	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Gray Hearth
Doors	Material Varies	Gray Hearth

South Post Area

Facilities located in the South Post Area typically exhibit a contemporary design. A majority of facilities have a rectilinear form with pitched roofs and gabled roofs that accentuate the entrances. Industrial type facilities have simpler facade colors, accents, and form. The roofs are flat with less emphasis on entrances. All facilities in this area are constructed of durable materials that have more facade accents than what is seen in the North Post Area. Detailing is exhibited mostly along the base, above the windows, and/or below the windows. A secondary material and color is used for accents. A majority of the facilities at this location house and support the Soldiers.

This area includes the following facility prototypes:

- Administrative
- Community
- Industrial & Maintenance
- Troop Housing
- Unit Operations

FIGURE 7-8 Key Map - South Post Facility Standards Area

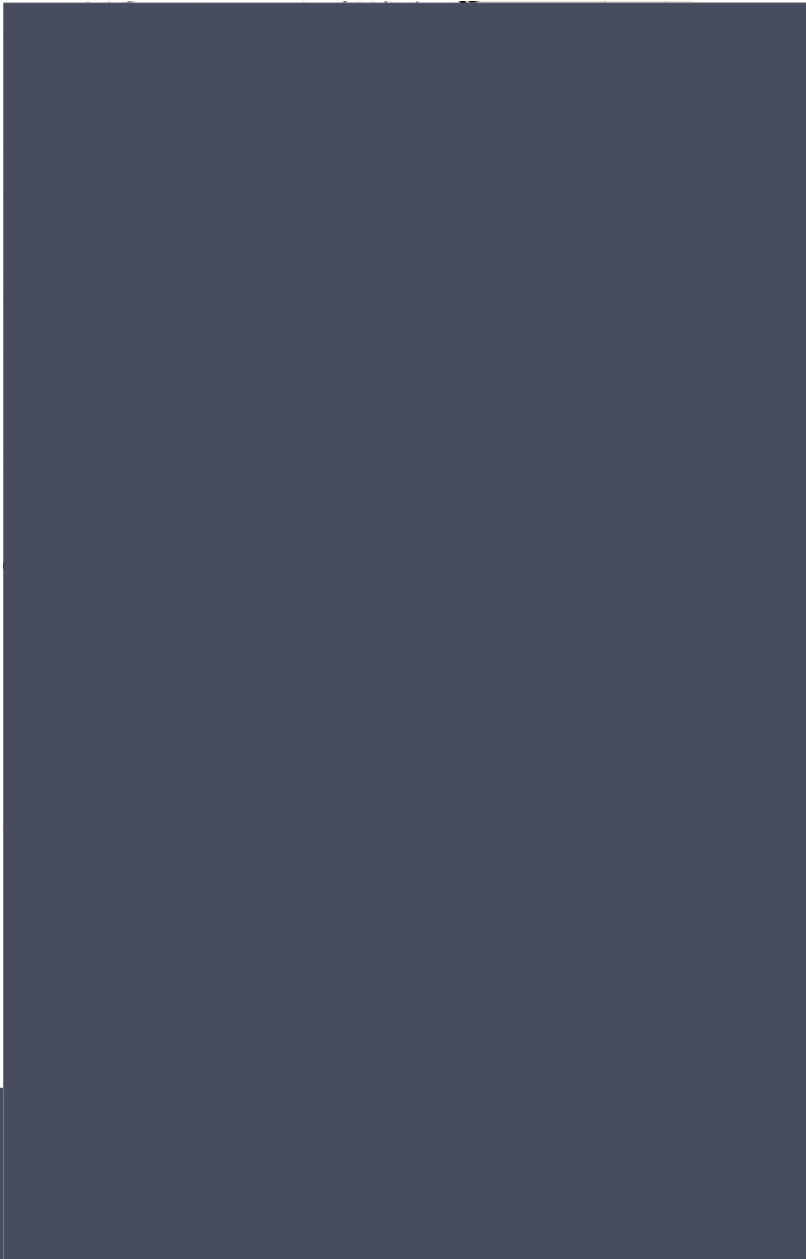


FIGURE 7-9 South Post— Administrative



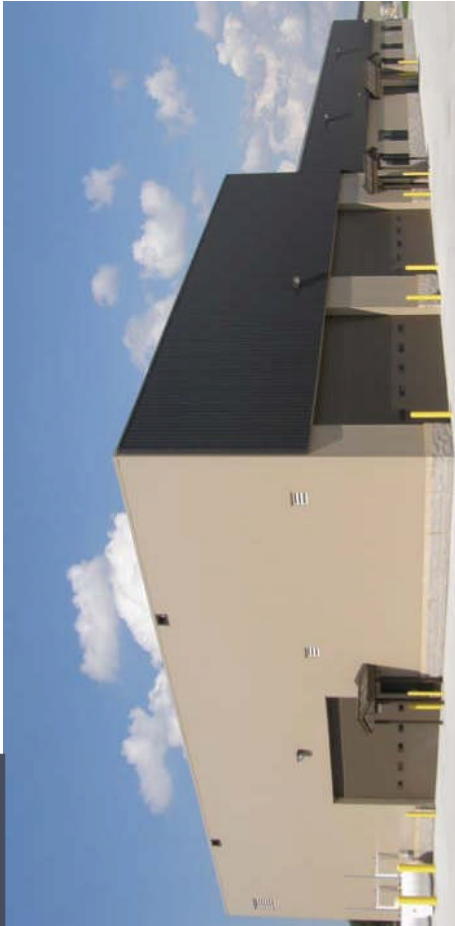
Item	Material	Color
Roof	Standing Seam Metal	Dark Brown
Walls	Standard Modular Brick	Primary Material—Chocolate Secondary Material— Natural
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Standard Modular Brick, Precast Concrete	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Metal	Bronze
Doors	Fiberglass Reinforced Panel	Bronze

FIGURE 7-10 South Post— Community



Item	Material	Color
Roof	Standing Seam Metal	Dark Brown
Walls	Standard Modular Brick	Primary Material— Chocolate Secondary Material— Natural
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Brick, Precast Concrete	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Metal	Bronze
Doors	Fiberglass Reinforced Panel	Bronze

FIGURE 7-11 South Post– Industrial & Maintenance




Item	Material	Color
Roof	Flat	Dark Brown
Walls	Metal	Primary Material– Natural Secondary Material– Chocolate
Base	Split-face CMU, Precast Concrete	10th Mountain Tan
Wall Accents	Not Allowed	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Metal	Bronze
Doors	Varies	Bronze

FIGURE 7-12 South Post– Troop Housing



Item	Material	Color
Roof	Standing Seam Metal	Dark Brown
Walls	Standard Modular Brick	Primary Material– Chocolate Secondary Material– Natural
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete / Brick	Beige / Beige Gray
Louvers	Material Varies	Match Roof/Wall/Door/Window Color
Windows	Metal	Bronze
Doors	Varies	Bronze

FIGURE 7-13 South Post– Unit Operations

		
Item	Material	Color
Roof	Standing Seam Metal	Dark Brown
Walls	Standard Modular Brick / Metal	Primary Color– Chocolate Secondary Color– Natural
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete / Brick	Beige
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Metal	Bronze
Doors	Varies	Bronze

Family Housing

The Family Housing Area supports the Soldiers and their accompanied families stationed at Fort Drum. Facilities consist of housing and recreational functions. The architectural style of the architecture is American Colonial constructed of materials with a variation of colors. Facilities do not exceed three stories and can have porches to accent the entrances. The design, material, and color selections for this area are determined by the Residential Communities Initiative (RC). They can provide further guidance for new construction in this area.

This area includes the following facility prototypes:

- Community
- Residential

FIGURE 7-14 Key Map - Family Housing Area

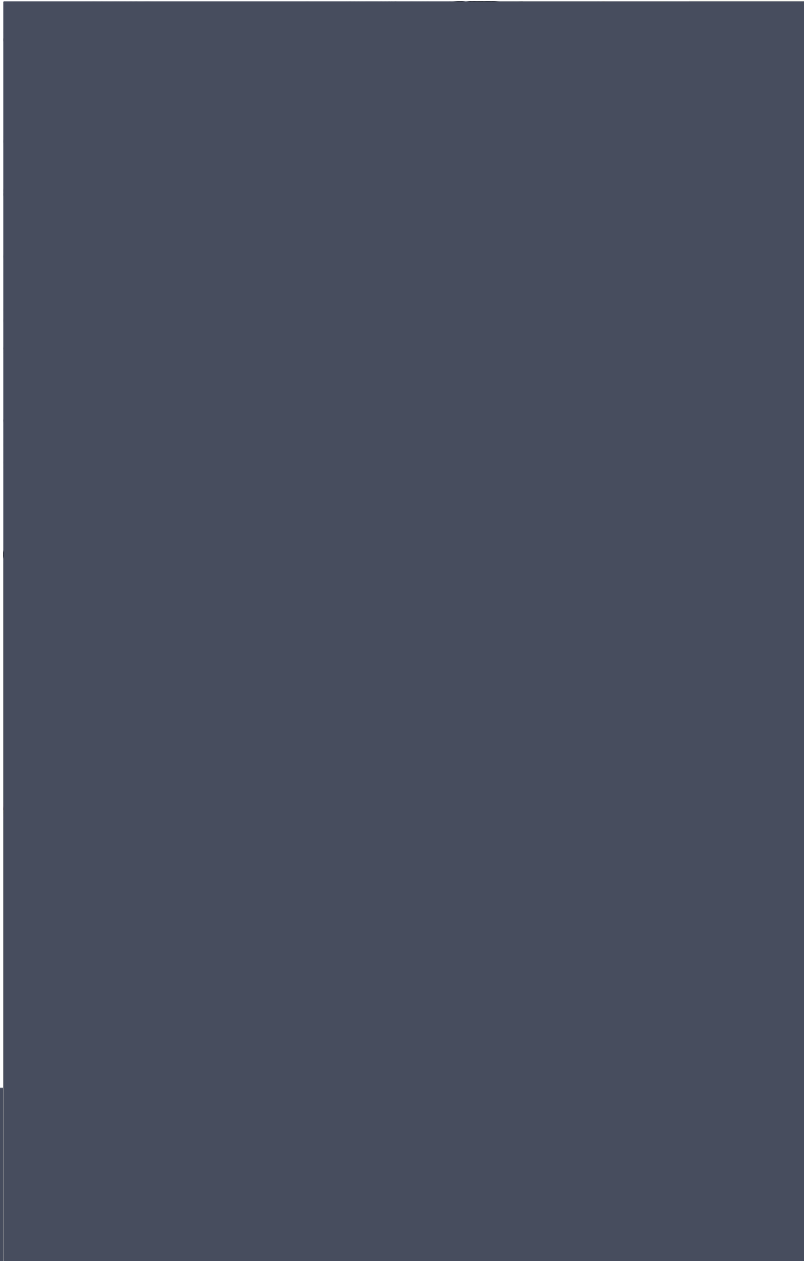


FIGURE 7-15

Family Housing– Community



Item	Material	Color
Roof	Asphalt Shingle	Refer to the RCI Guidelines
Walls	Siding	
Base	Concrete (Optional)	
Wall Accents	Stone (Optional)	
Louvers	Material Varies	
Windows	Metal, Vinyl	
Doors	Wood, Metal, or Vinyl	

FIGURE 7-16

Family Housing– Residential



Item	Material	Color
Roof	Asphalt Shingle	Refer to the RC Guidelines
Walls	Siding	
Base	Concrete (Optional)	
Wall Accents	N/A	
Louvers	Material Varies	
Windows	Metal, Vinyl	
Doors	Wood, Metal, or Vinyl	

Parks & Recreation

The centrally located Park & Recreation Area is exclusively used and characterized by recreational activities. Facilities range to having a significant one-story structure to providing basic shelter from the elements, like a pavilion. The architecture is simple in design with rectilinear with pitched and gabled roofs. Accents materials and colors are used on the trim and along the base of the structure. To fit in with the natural setting of the location, natural materials, like wood and stone, are used in the exterior design of these facilities.

- This area includes only one facility prototype:
- Community

FIGURE 7-17 Key Map - Parks & Recreation Area



FIGURE 7-18 Parks & Recreation—Community



Item	Material	Color
Roof	Asphalt Shingle	Dark Gray
Walls	Wood	Natural Stain
Base	Patterned Concrete	Light Limestone Gray
Wall Accents	Wood	Green
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Gray Hearth
Doors	Material Varies	Gray Hearth

Airfield

Facilities within the Airfield Area primarily function as support to the airfield mission. Other functions include housing for Soldiers, storage, maintenance, and community support. These facilities vary in character from industrial to a more durable contemporary facade. All of the facilities are rectilinear in shape with varying roof styles, not exceeding three stories. The more durable facilities have a hipped and gabled roof with additional emphasis at their entrances. These durable facilities are constructed of brick and split-face CMU with accents along the base and around entrances. Very few other accents are seen in these facades. The industrial and operations facilities are typically constructed of metal paneling in a rectangular form that allows for a large floor space. These facilities have flat roofs but are accented with a secondary color along the top, providing more interest and human scale.

This area includes the following facility prototypes:

- Administrative
- Community
- Industrial & Maintenance
- Troop Housing
- Unit Operations

FIGURE 7-19

Key Map - Airfield Area

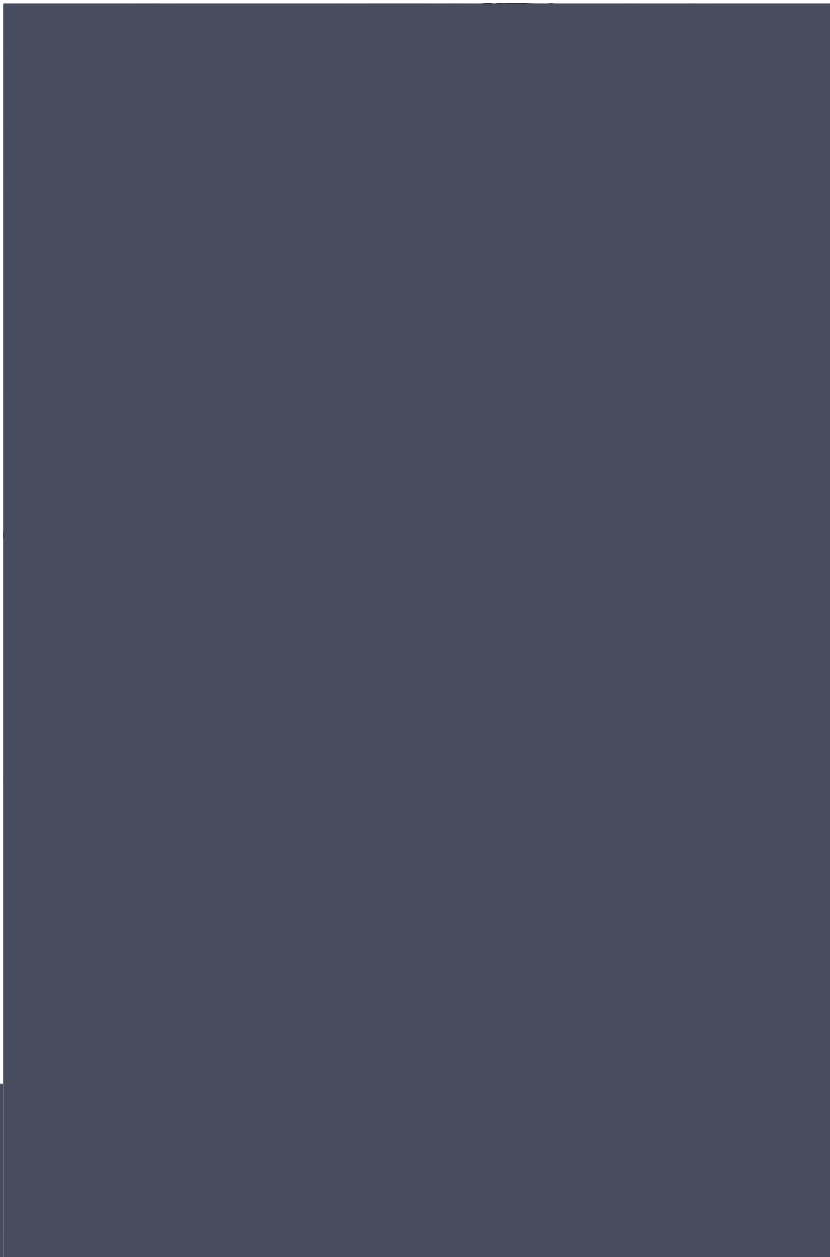


FIGURE 7-20 Airfield— Administrative



Item	Material	Color
Roof	Standing Seam Metal	Gray Hearth
Walls	Standard Modular Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete / Brick	Natural Limestone Gray
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Bronze
Doors	Material Varies	Bronze

FIGURE 7-21 Airfield— Community



Item	Material	Color
Roof	Standing Seam Metal / Flat	Gray Hearth
Walls	Standard Modular Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete / Brick	Natural Limestone Gray
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Bronze
Doors	Material Varies	Bronze

FIGURE 7-22 Airfield— Industrial & Maintenance



Item	Material	Color
Roof	Flat / Standing Seam Metal	Gray Hearth
Walls	Metal Paneling	Primary Color— Allspice Secondary Color— Gray Hearth
Base	Concrete	10th Mountain Tan
Wall Accents	Metal Siding	Salsa
Louvers	Material Varies	Match Roof, or Wall Color
Windows	Metal	Sequoia
Doors	Varies	Sequoia

FIGURE 7-23 Airfield— Troop Housing



Item	Material	Color
Roof	Standing Seam Metal	Gray Hearth
Walls	Standard Modular Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete	Beige
Louvers	Material Varies	Match Roof, Wall, Door or Window Color
Windows	Material Varies	Black
Doors	Material Varies	Black

FIGURE 7-24 Airfield– Unit Operations



Item	Material	Color
Roof	Standing Seam Metal	Gray Hearth
Walls	Standard Modular Brick	Old Bridge
Base	Split-face CMU	10th Mountain Tan
Wall Accents	Precast Concrete	Natural Limestone Gray
Louvers	Material Varies	Match Roof, Wall, Door, or Window Color
Windows	Material Varies	Black
Doors	Material Varies	Black

APPENDIX K EXTERIOR MATERIALS CHART

Introduction

The design character of an installation's facilities affect its overall image. Facilities help define the character of visual zones and themes presented in Section 5.

The IDG encompasses facility design components and an analysis of their character, organization, and placement; and how they relate to their surrounding environment. The preservation of historically and culturally significant structures adds to an installation's character and provides a sense of heritage.

This analysis of facilities also considers the placement of entrances, concern for accessibility, use of materials, incorporation of additions and renovations, incorporation of plazas and courtyards, and the appropriateness and quality of building maintenance.

This section provides objectives and visual determinants to identify and be utilized in new construction. In general, using architectural style, materials, and colors indigenous to the region. These standards and guidance pertain to the development and maintenance of the various exteriors of buildings on the installation.

The following charts include exterior building materials and components for all facilities on Post. The exterior materials have been determined in concurrence with the Facility Prototype Areas Map presented in Section 7 (Figure 7-X). Exterior materials should be selected to match and complement materials used for similar building types and to enhance the visual impression of the visual zone in which they are located. All material selections will require approval from the DPW and must comply with all requirements and guidance provided in this IDG.



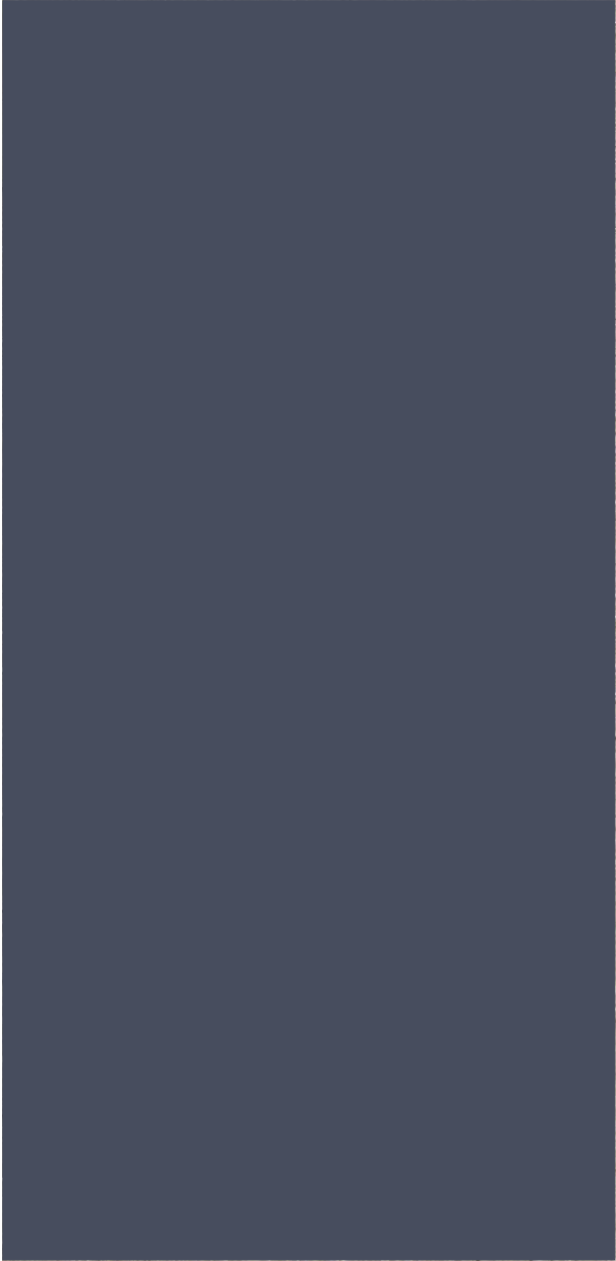
Type: Standard Modular Brick
Color: Red
Manufacturer: To be approved by the DPW
the DPW

Type: Standard Brick
Color: Chocolate
Manufacturer: To be approved by the DPW

Type: Standard Brick
Color: Beige
Manufacturer: To be approved by the DPW



Type: Split-face CMU
Color: 10th Mountain Tan
Manufacturer: To be approved by the DPW



Type: Concrete
Color: 10th Mountain Tan
Manufacturer: To be approved by the DPW



Type: Concrete
Color: Gray
Manufacturer: To be approved by the DPW



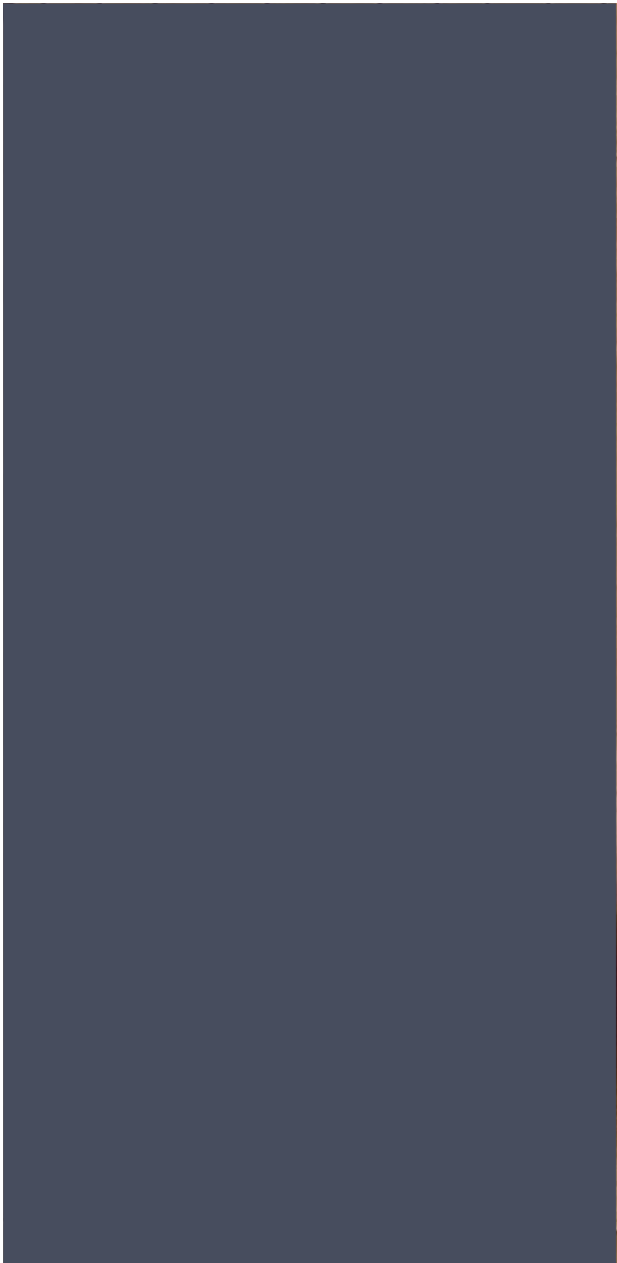
Type: Concrete
Color: Natural Limestone Gray
Manufacturer: To be approved by the DPW



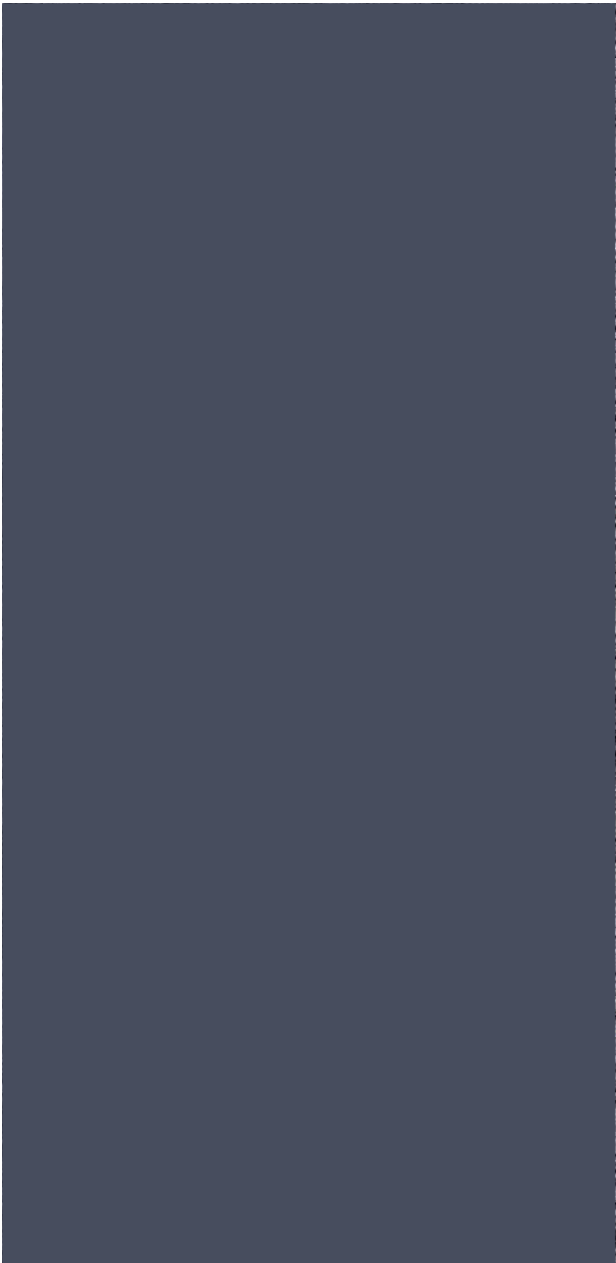
Type: Patterned Concrete
Color: Light Limestone Gray
Manufacturer: To be approved by the DPW



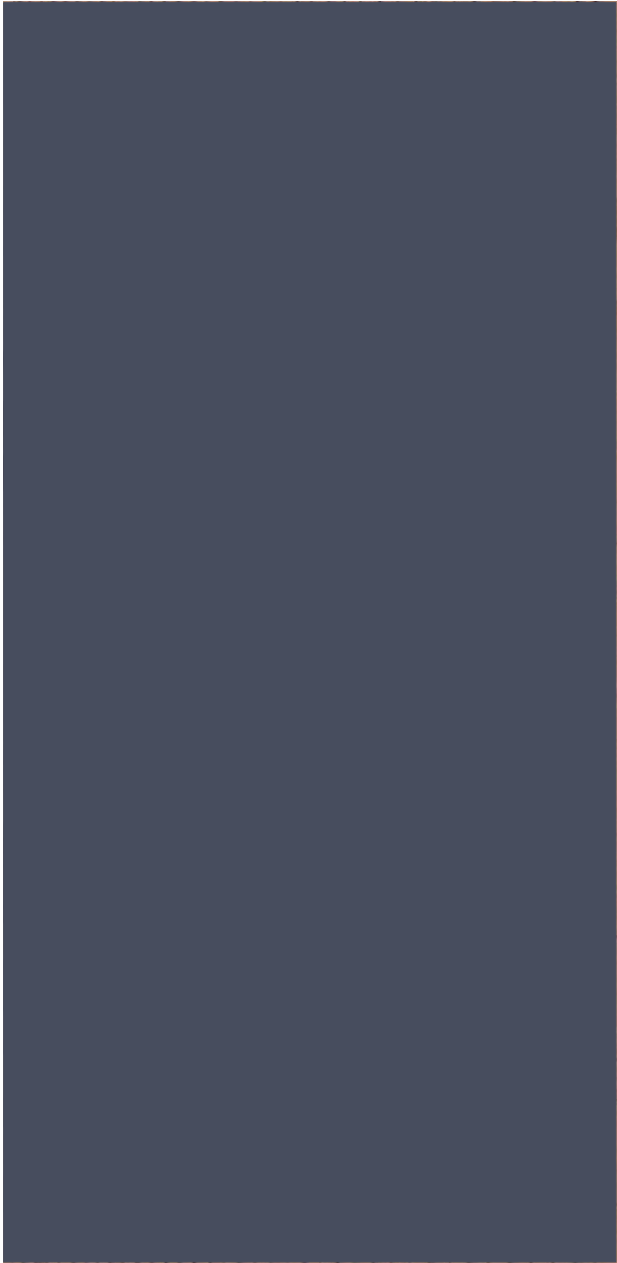
Type: Wood
Color: Natural Stain
Manufacturer: To be approved by the DPW



Type: Asphalt Shingle
Color: Dark Gray
Manufacturer: To be approved by the DPW



Type: Asphalt Shingle
Color: Brown
Manufacturer: To be approved by the DPW



Type: Standing Seam
Color: Dark Brown
Manufacturer: To be approved by the DPW





Type: Standing Seam
Color: Gray
Manufacturer: To be approved by the DPW

APPENDIX L

EXTERIOR COLORS CHART

FIGURE L-1
Exterior Color Regions

Exterior Color Regions

The United States Army provides mandatory common facility and infrastructure standards for all Army installations by geographic region. Color options are given for exterior finishes for eight U.S. regions plus Europe and the Far East. Fort Drum is located in the Northeast USA color region (see Figure L.1).

Exterior Color Charts for Installation Buildings

Color schemes and building materials are critical design elements in relating adjacent buildings and creating a compatible visual environment within an installation. Fort Drum has specific colors that are described in this appendix. Other guidance can be sought in the Installation Design Standards: Chapter 3, Paragraph 3.5.5 Color, 3.5.5.2 Historic Buildings, 3.5.6 Texture, 3.5.7 Material, and 3.11 Renovations and Additions. The overall intent and directional direction on the use and application of colors is to:

- Avoid cluttered, cosmetic application of a number of different colors on a facade. The exterior color scheme should consist of a wall color, trim color, and an accent color, all of which should work together with the choice of roofing to provide a harmonious appearance compatible with adjacent structures and environs.
- Select colors from the following Exterior Color Chart based upon their appropriateness to the building type, desired appearance, material to be painted, and prevailing architectural design and landscape character of the installation. Sustainability and ease of maintenance should also be considered.
- Avoid garish colors. Strong or vibrant colors should be used with restraint and should be limited to accents or focal points such as entrance doors where appropriate.

PANTONE® Colors

The six-digit color designations found in the Exterior Color Charts are numbers taken from the **PANTONE for architecture and interiors color guide**, which have been cross-referenced to the **PANTONE process guide coated**. The colors in the **PANTONE process guide coated** are intended for viewing on a color monitor and for printing on a four-color process printer (CMYK) using ISO 2846-1 inks. With proper calibration, colors viewed and printed should accurately represent the specified color.

- Calibration for Dell FP E171 and 1800FP Monitor is per manufacturer's recommendation.
- Calibration for Hewlett Packard Color 4500 is per manufacturer's recommendation.
- For calibration of equipment other than the above, contact Pantone, Inc. at (201) 935-5500.

Color Validation

Due to calibration and other technical problems, the color of paint to be used should be based on manufacturer's correspondence to the six-digit **PANTONE** Number and shall not be predicated on matching a computer-generated sample as seen in the Exterior Color Charts.

"White" when given without a number shall be construed as generic and is intended to cover those manufacturer's paints and finished materials called "white". Some slight variance may be discernible from one manufacturer to another.

Color Names

Names given for colors are not those assigned by Pantone, Inc., but are the generic names used by the Army for general color identification only. Always use the six-digit **PANTONE for architecture and interiors color guide** number instead of the generic name when specifying a color.

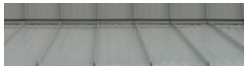



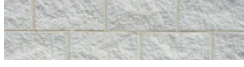
Factory Finished Materials

Colors given for surfaces that will be factory finished during manufacturing are intended for guidance and are not intended to constitute a directive for a custom color or finish. Colors shall be selected from standard manufacturer colors with the exception of those products, which can be finished with a custom color at no additional cost or that would not result in diminishment of the standard material guarantee or serviceability.

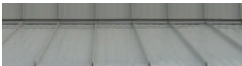



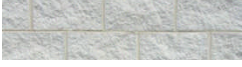
EXTERIOR COLOR CHART			Fort Drum Common Name
Additional Reference Information	Original Product/Color		
Base Course Split Face Block	Taylor Concrete 10th Mountain Tan		10th Mountain Tan
North Post Standard Brick	Glen-Gray Brick Old Bridge C-107		Old Bridge
South Post Standard Brick	Glen-Gary, Tuscan Series, Cocoa Velour		Chocolate
South Post Standard Brick	Glen-Gery, Extruded Series, Fall Grey Velour		Natural
Insulated Panel Systems Lanape Trail	Benjamin Moore #1222		Allspice
Roofs, Misc. Objects	Varco Pruden, SSR, Patricia Bronze		Dark Brown
North Post/Airfield Metal Roofs	Glidden Grey Tweed 30YY 22/059		Gray
Maintenance Building Doors	Pratt & Lambery Sequoia #R0202A		Sequoia
South Post Metal Panel Walls (Main Body)	Metal Span, Fluropan, Desert Beige		Beige
Airfield Maintenance Buildings Accent Strip	-		Salsa
-	Taylor Concrete Buckskin		Buckskin
-	Glen-Gary Brick Fall Gray		Fall Gray
Window/ Door Frame	Kawner Medium Bronze, No. 28		Bronze
North Post Roofs	Glidden Grey Hearth 30YY 16/032		Grey Hearth
-	Glidden Grey Expectation 40YY 48/048		Light Grey
	Glidden Sisal 30YY 41/165		Dust

South Post Exterior Colors – Single Story Building



Element		Color	Reference
Roof		Dark Brown	Varco Pruden Patrician Bronze
Primary Brick		Chocolate	Glen-Gary® Coco Velour
Accent Brick		Natural	Taylor Concrete Products Tan
Accent Concrete		Beige	Steps Plus 704B
Split Face Block		10 th Mt. Tan	Taylor Concrete Products 10 th Mountain Tan



Element		Color	Reference
Roof		Dark Brown	Varco Pruden Patrician Bronze
Primary Brick		Chocolate	Glen-Gary® Coco Velour
Accent Brick		Natural	Taylor Concrete Products Tan
Accent Concrete		Beige	Steps Plus 704B
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Primary Brick		Chocolate	Glen-Gary® Coco Velour
Accent Brick		Natural	Taylor Concrete Products Tan
Accent Concrete		Beige	Steps Plus 704B
Split Face Block		10 th Mt. Tan	Taylor Concrete Products 10 th Mountain Tan